

Exhibit
F

Folder 3

Pt. 2

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application evaluated and all units ug/l, unless otherwise specified *Measured as Dissolved species
Acute (WLA _a)	Chronic (WLA _c)					
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acu and chronic standards for estuarine, per 93-015) ug/l
Fluoranthene	<10		370 Human Health Std		19,000 Human Health WLA	Value is less than detection
Fluorene	<10		14000 Human Health Std		700,000 Human Health WLA	Value is less than detection
Ideno(1,2,3-cd)pyrene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Isophorone	<10		26000 Human Health Std.		13,000 ,000 Human Health WLA	Value is less than detection
Pyrene	<10		11000 Human Health Std		550,000 Human Health WLA	Value is less than detection
1,2,4-Trichlorobenzene	<10		940 Human Health Std		47,000 Human Health WLA	Value is less than detection
Volatiles						

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				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acut and chronic standards for estuarine, per 93-015) ug/l
Benzene	<5		710 Human Health Std		36,000 Human Health WLA	Value is less than detection
Bromoform	<5		3500 Human Health Std		180,000 Human Health WLA	Value is less than detection
Carbon Tetrachloride	<5		44 Human Health Std		2200 Human Health Std	Value is less than detection
Chlorodibromomethane	<5		340 Human Health Std		17000 Human Health WLA	Value is less than detection
Chloroform	<5		29000 Human Health Std		1500,000 Human Health WLA	Value is less than detection
Dichloromethane	<5		16000 Human Health Std		800,000 Human Health WLA	Value is less than detection
Dichlorobromomethane	<5		450 Human Health Std		23,000 Human Health WLA	Value is less than detection

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				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application evaluated and all units ug/l, unless otherwise specified
Acute (WLA _a)	Chronic (WLA _c)	*Measured as Dissolved species				
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
1, 2-Dichloroethane	<5		990 Human Health Std		50,000 Human Health WLA	Value is less than detection
1,1-Dichloroethylene	<5		17000 Human Health Std		850,000 Human Health WLA	Value is less than detection
Ethylbenzene	<5		29000 Human Health Std		1,500,00 Human Health WLA	Value is less than detection
Tetrachloroethylene	<5		89 Human Health Std		4500 Human Health Std	Value is less than detection
Vinyl Chloride	<10		61 Human Health Std		3100 Human Health Std	Value is less than detection
Acids Extractables						
2-Chlorophenol	<10		400 Human Health Std		20,000 Human Health WLA	Value is less than detection
2,4-Dichlorophenol	<10		790 Human Health Std		40,000 Human Health WLA	Value is less than detection

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				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acut and chronic standards for estuarine, per 93-015) ug/l
2,4-Dimethylphenol	<10		2300 Human Health Std		120,000 Human Health WLA	Value is less than detection
Pentachlorophenol	<50	13	7.9 82HH	26	400 4100HH	Value is less than detection
2,4,6-Trichlorophenol	<10		65 Human Health Std		3300 Human Health WLA	Value is less than detection

WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name:
Receiving Stream:

Omega Protein 004/005
Cockrell's Creek

Permit No.: VA0003867

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	NA	mg/l
90th % Temperature (Annual) =	28.41	(° C)
90th % Temperature (Winter) =		(° C)
90th % Maximum pH =	8.37	
10th % Maximum pH =		
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	1	(1 =
Mean Salinity =	17	(g/kg

Mixing Information

Design Flow (MGD)	14.2
Acute WLA multiplier	2
Chronic WLA multiplier	50
Human health WLA multiplier	50
Agency defaults used	

Effluent Information

Mean Hardness (as CaCO3) =	NA	mg/L
90 % Temperature (Annual) =	38	(° C)
90 % Temperature (Winter) =	22	(° C)
90 % Maximum pH =	8.94	SU
10 % Maximum pH =		SU
Discharge Flow =	14.2	MGD

[illegible]

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Chlorobenzene		--	--	2.1E+04	--	--	1.1E+06	--	--	--	--	--	--	--	--	1.1E+06
Chlorodibromomethane ^C	0	--	--	3.4E+02	--	--	1.7E+04	--	--	--	--	--	--	--	--	1.7E+04
Chloroform ^C	0	--	--	2.9E+04	--	--	1.5E+06	--	--	--	--	--	--	--	--	1.5E+06
2-Chloronaphthalene	0	--	--	4.3E+03	--	--	2.2E+05	--	--	--	--	--	--	--	--	2.2E+05
2-Chlorophenol	0	--	--	4.1E+02	--	--	2.0E+04	--	--	--	--	--	--	--	--	2.0E+04
Chlorpyrifos	0	1.1E-02	5.6E-03	--	2.2E-02	2.8E-01	--	--	--	--	--	--	--	2.2E-02	2.8E-01	--
Chromium III	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI	0	1.1E+03	5.0E+01	--	2.2E+03	2.5E+03	--	--	--	--	--	--	--	2.2E+03	2.5E+03	--
Chrysene ^C	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Copper	0	9.3E+00	6.0E+00	--	1.9E+01	3.0E+02	--	--	--	--	--	--	--	1.9E+01	3.0E+02	--
Cyanide	0	1.0E+00	1.0E+00	2.2E+05	2.0E+00	5.0E+01	1.1E+07	--	--	--	--	--	--	2.0E+00	5.0E+01	1.1E+07
DDD ^C	0	--	--	8.4E-03	--	--	4.2E-01	--	--	--	--	--	--	--	--	4.2E-01
DDE ^C	0	--	--	5.9E-03	--	--	3.0E-01	--	--	--	--	--	--	--	--	3.0E-01
DDT ^C	0	1.3E-01	1.0E-03	5.9E-03	2.6E-01	5.0E-02	3.0E-01	--	--	--	--	--	--	2.6E-01	5.0E-02	3.0E-01
Demeton	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Dibenz(a,h)anthracene ^C	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Dibutyl phthalate	0	--	--	1.2E+04	--	--	6.0E+05	--	--	--	--	--	--	--	--	6.0E+05
Dichloromethane (Methylene Chloride) ^C	0	--	--	1.6E+04	--	--	8.0E+05	--	--	--	--	--	--	--	--	8.0E+05
1,2-Dichlorobenzene	0	--	--	1.7E+04	--	--	8.5E+05	--	--	--	--	--	--	--	--	8.5E+05
1,3-Dichlorobenzene	0	--	--	2.6E+03	--	--	1.3E+05	--	--	--	--	--	--	--	--	1.3E+05
1,4-Dichlorobenzene	0	--	--	2.6E+03	--	--	1.3E+05	--	--	--	--	--	--	--	--	1.3E+05
3,3-Dichlorobenzidine ^C	0	--	--	7.7E-01	--	--	3.9E+01	--	--	--	--	--	--	--	--	3.9E+01
Dichlorobromomethane ^C	0	--	--	4.6E+02	--	--	2.3E+04	--	--	--	--	--	--	--	--	2.3E+04
1,2-Dichloroethane ^C	0	--	--	9.9E+02	--	--	5.0E+04	--	--	--	--	--	--	--	--	5.0E+04
1,1-Dichloroethylene	0	--	--	1.7E+04	--	--	8.5E+05	--	--	--	--	--	--	--	--	8.5E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+05	--	--	7.0E+06	--	--	--	--	--	--	--	--	7.0E+06
2,4-Dichlorophenol	0	--	--	7.9E+02	--	--	4.0E+04	--	--	--	--	--	--	--	--	4.0E+04
1,2-Dichloropropane ^C	0	--	--	3.9E+02	--	--	2.0E+04	--	--	--	--	--	--	--	--	2.0E+04
1,3-Dichloropropene	0	--	--	1.7E+03	--	--	8.5E+04	--	--	--	--	--	--	--	--	8.5E+04
Dieldrin ^C	0	7.1E-01	1.9E-03	1.4E-03	1.4E+00	9.5E-02	7.0E-02	--	--	--	--	--	--	1.4E+00	9.5E-02	7.0E-02
Diethyl Phthalate	0	--	--	1.2E+05	--	--	6.0E+06	--	--	--	--	--	--	--	--	6.0E+06
Di-2-Ethylhexyl Phthalate ^C	0	--	--	5.9E+01	--	--	3.0E+03	--	--	--	--	--	--	--	--	3.0E+03
2,4-Dimethylphenol	0	--	--	2.3E+03	--	--	1.2E+05	--	--	--	--	--	--	--	--	1.2E+05
Dimethyl Phthalate	0	--	--	2.9E+06	--	--	1.5E+08	--	--	--	--	--	--	--	--	1.5E+08
Di-n-Butyl Phthalate	0	--	--	1.2E+04	--	--	6.0E+05	--	--	--	--	--	--	--	--	6.0E+05
2,4 Dinitrophenol	0	--	--	1.4E+04	--	--	7.0E+05	--	--	--	--	--	--	--	--	7.0E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	7.65E+02	--	--	3.8E+04	--	--	--	--	--	--	--	--	3.8E+04
2,4-Dinitrotoluene ^C	0	--	--	9.1E+01	--	--	4.6E+03	--	--	--	--	--	--	--	--	4.6E+03
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	1.2E-06	--	--	6.0E-05	--	--	--	--	--	--	--	--	6.0E-05
1,2-Diphenylhydrazine ^C	0	--	--	5.1E+00	--	--	2.7E+02	--	--	--	--	--	--	--	--	2.7E+02
Alpha-Endosulfan	0	3.4E-02	8.7E-03	2.4E+02	6.8E-02	4.4E-01	1.2E+04	--	--	--	--	--	--	6.8E-02	4.4E-01	1.2E+04

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	2.4E+02	6.8E-02	4.4E-01	1.2E+04	-	-	-	-	-	-	6.8E-02	4.4E-01	1.2E+04
Endosulfan Sulfate	0	-	-	2.4E+02	-	-	1.2E+04	-	-	-	-	-	-	-	-	1.2E+04
Endrin	0	3.7E-02	2.3E-03	8.1E-01	7.4E-02	1.2E-01	4.1E+01	-	-	-	-	-	-	7.4E-02	1.2E-01	4.1E+01
Endrin Aldehyde	0	-	-	8.1E-01	-	-	4.1E+01	-	-	-	-	-	-	-	-	4.1E+01
Ethylbenzene	0	-	-	2.9E+04	-	-	1.5E+06	-	-	-	-	-	-	-	-	1.5E+06
Fluoranthene	0	-	-	3.7E+02	-	-	1.9E+04	-	-	-	-	-	-	-	-	1.9E+04
Fluorene	0	-	-	1.4E+04	-	-	7.0E+05	-	-	-	-	-	-	-	-	7.0E+05
Guthion	0	-	1.0E-02	-	-	5.0E-01	-	-	-	-	-	-	-	-	5.0E-01	-
Heptachlor ^C	0	5.3E-02	3.6E-03	2.1E-03	1.1E-01	1.8E-01	1.1E-01	-	-	-	-	-	-	1.1E-01	1.8E-01	1.1E-01
Heptachlor Epoxide ^C	0	5.3E-02	3.6E-03	1.1E-03	1.1E-01	1.8E-01	5.5E-02	-	-	-	-	-	-	1.1E-01	1.8E-01	5.5E-02
Hexachlorobenzene ^C	0	-	-	7.7E-03	-	-	3.9E-01	-	-	-	-	-	-	-	-	3.9E-01
Hexachlorobutadiene ^C	0	-	-	5.0E+02	-	-	2.5E+04	-	-	-	-	-	-	-	-	2.5E+04
Hexachlorocyclohexane Alpha-BHC ^C	0	-	-	1.3E-01	-	-	6.5E+00	-	-	-	-	-	-	-	-	6.5E+00
Hexachlorocyclohexane Beta-BHC ^C	0	-	-	4.6E-01	-	-	2.3E+01	-	-	-	-	-	-	-	-	2.3E+01
Hexachlorocyclohexane Gamma-BHC ^C (Lindane)	0	1.6E-01	-	6.3E-01	3.2E-01	-	3.2E+01	-	-	-	-	-	-	3.2E-01	-	3.2E+01
Hexachlorocyclopentadiene	0	-	-	1.7E+04	-	-	8.5E+05	-	-	-	-	-	-	-	-	8.5E+05
Hexachloroethane ^C	0	-	-	8.5E+01	-	-	4.5E+03	-	-	-	-	-	-	-	-	4.5E+03
Hydrogen Sulfide	0	-	2.0E+00	-	-	1.0E+02	-	-	-	-	-	-	-	-	1.0E+02	-
Indeno (1,2,3-cd) pyrene C	0	-	-	4.9E-01	-	-	2.5E+01	-	-	-	-	-	-	-	-	2.5E+01
Isophorone ^C	0	-	-	2.6E+04	-	-	1.3E+06	-	-	-	-	-	-	-	-	1.3E+06
Kepone	0	-	0.0E+00	-	-	0.0E+00	-	-	-	-	-	-	-	-	0.0E+00	-
Lead	0	2.4E+02	9.3E+00	-	4.8E+02	4.7E+02	-	-	-	-	-	-	-	4.8E+02	4.7E+02	-
Malathion	0	-	1.0E-01	-	-	5.0E+00	-	-	-	-	-	-	-	-	5.0E+00	-
Mercury	0	1.8E+00	9.4E-01	5.1E-02	3.6E+00	4.7E+01	2.6E+00	-	-	-	-	-	-	3.6E+00	4.7E+01	2.6E+00
Methyl Bromide	0	-	-	4.0E+03	-	-	2.0E+05	-	-	-	-	-	-	-	-	2.0E+05
Methoxychlor	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
Mirex	0	-	0.0E+00	-	-	0.0E+00	-	-	-	-	-	-	-	-	0.0E+00	-
Monochlorobenzene	0	-	-	2.1E+04	-	-	1.1E+06	-	-	-	-	-	-	-	-	1.1E+06
Nickel	0	7.4E+01	8.2E+00	4.6E+03	1.5E+02	4.1E+02	2.3E+05	-	-	-	-	-	-	1.5E+02	4.1E+02	2.3E+05
Nitrobenzene	0	-	-	1.9E+03	-	-	9.5E+04	-	-	-	-	-	-	-	-	9.5E+04
N-Nitrosodimethylamine ^C	0	-	-	8.1E+01	-	-	4.1E+03	-	-	-	-	-	-	-	-	4.1E+03
N-Nitrosodiphenylamine ^C	0	-	-	1.6E+02	-	-	8.0E+03	-	-	-	-	-	-	-	-	8.0E+03
N-Nitrosodi-n-propylamine ^C	0	-	-	1.4E-01	-	-	7.0E+02	-	-	-	-	-	-	-	-	7.0E+02
Parathion	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCB-1016	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
PCB-1221	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
PCB-1232	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
PCB-1242	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
PCB-1248	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-
PCB-1254	0	-	3.0E-02	-	-	1.5E+00	-	-	-	-	-	-	-	-	1.5E+00	-

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
PCB-1260	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	1.5E+00	--
PCB Total ^C	0	--	--	1.7E-03	--	--	8.5E-02	--	--	--	--	--	--	--	--	8.5E-02
Pentachlorophenol ^C	0	1.3E+01	7.9E+00	8.2E+01	2.6E+01	4.0E+02	4.1E+03	--	--	--	--	--	--	2.6E+01	4.0E+02	4.1E+03
Phenol	0	--	--	4.6E+06	--	--	2.3E+08	--	--	--	--	--	--	--	--	2.3E+08
Phosphorus (Elemental)	0	--	0.1	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Pyrene	0	--	--	1.1E+04	--	--	5.5E+05	--	--	--	--	--	--	--	--	5.5E+05
Radionuclides (pCi/l except Beta/Photon)	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity Beta and Photon Activity (mrem/yr)	0	--	--	1.5E+01	--	--	7.5E+02	--	--	--	--	--	--	--	--	7.5E+02
Strontium-90	0	--	--	4.0E+00	--	--	2.0E+02	--	--	--	--	--	--	--	--	2.0E+02
Tritium	0	--	--	8.0E+00	--	--	4.0E+02	--	--	--	--	--	--	--	--	4.0E+02
Selenium	0	--	--	2.0E+04	--	--	1.0E+06	--	--	--	--	--	--	--	--	1.0E+06
Silver	0	3.0E+02	7.1E+01	1.1E+04	6.0E+02	3.6E+03	5.5E+05	--	--	--	--	--	--	6.0E+02	3.6E+03	5.5E+05
1,1,2,2-Tetrachloroethane ^C	0	2.0E+00	--	--	4.0E+00	--	--	--	--	--	--	--	--	4.0E+00	--	--
Tetrachloroethylene ^C	0	--	--	1.1E+02	--	--	5.5E+03	--	--	--	--	--	--	--	--	5.5E+03
Thallium	0	--	--	8.9E+01	--	--	4.5E+03	--	--	--	--	--	--	--	--	4.5E+03
Toluene	0	--	--	6.3E+00	--	--	3.2E+02	--	--	--	--	--	--	--	--	3.2E+02
Toxaphene ^C	0	--	--	2.0E+05	--	--	1.0E+07	--	--	--	--	--	--	--	--	1.0E+07
Tributyltin	0	2.1E-01	2.0E-04	7.5E-03	4.2E-01	1.0E-02	3.8E-01	--	--	--	--	--	--	4.2E-01	1.0E-02	3.8E-01
1,2,4-Trichlorobenzene	0	3.8E-01	1.0E-03	--	7.6E-01	5.0E-02	--	--	--	--	--	--	--	7.6E-01	5.0E-02	--
1,1,2-Trichloroethane ^C	0	--	--	9.4E+02	--	--	4.7E+04	--	--	--	--	--	--	--	--	4.7E+04
Trichloroethylene ^C	0	--	--	4.2E+02	--	--	2.1E+04	--	--	--	--	--	--	--	--	2.1E+04
2,4,6-Trichlorophenol ^C	0	--	--	8.1E+02	--	--	4.1E+04	--	--	--	--	--	--	--	--	4.1E+04
Vinyl Chloride ^C	0	--	--	6.5E+01	--	--	3.3E+03	--	--	--	--	--	--	--	--	3.3E+03
Zinc	0	--	--	6.1E+01	--	--	3.1E+03	--	--	--	--	--	--	--	--	3.1E+03
	0	9.0E+01	8.1E+01	6.9E+04	1.8E+02	4.1E+03	3.5E+06	--	--	--	--	--	--	1.8E+02	4.1E+03	3.5E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	2.2E+05
Arsenic III	5.5E+01
Cadmium	3.2E+01
Chromium III	#VALUE!
Chromium VI	8.8E+02
Copper	7.4E+00
Lead	1.9E+02
Mercury	1.4E+00
Nickel	5.9E+01
Selenium	2.4E+02
Silver	1.6E+00
Zinc	7.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

9/27/04 8:39:50 AM

Facility = Omega 995 (004+005)
Chemical = ammonia
Chronic averaging period = 30
WLAa = 1.4
WLAc = 10
Q.L. = 0.2
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 8
Expected Value = .447471
Variance = .072083
C.V. = 0.6
97th percentile daily values = 1.08888
97th percentile 4 day average = .744498
97th percentile 30 day average = .539674
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0.309
0.298
0.281
0.296
0
0.575
0.553
3.7

9/27/04 8:42:21 AM

Facility = Omega 995 (004+005)
Chemical = Cadmium
Chronic averaging period = 4
WLAa = 80
WLAc = 440
Q.L. = 5
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 8
Variance = 23.04
C.V. = 0.6
97th percentile daily values = 19.4673
97th percentile 4 day average = 13.3103
97th percentile 30 day average = 9.64842
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

- (3) If, prior to completing the monitoring requirements specified in I. C.1.b. (1) above, it is determined that the effluent fails the decision criteria outlined in I. C.1.b. (2), the effluent shall be considered to have demonstrated actual potential toxicity and a Whole Effluent Toxicity (WET) limit and a compliance period will be required.
- (4) Following successful completion of the testing of outfall 001 as in I. C.1.b. (1) above, the permittee shall resume annual acute and chronic toxicity testing of the outfall. The first annual tests shall be conducted within 30 days of initial annual discharge from the outfall following completion of the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests, or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a WET limit of the outfall has been established.
- (5) If, in the testing according to I.C.1.b. (4) above, any of the annual acute toxicity tests yields an LC_{50} of less than 7% effluent, or any of the annual chronic tests yields an NOEC less than the IWC of 0.9%, the test shall be repeated within three months.
 - (a) If the retest also indicates an LC_{50} of less than 7% effluent or an NOEC less than the IWC, quarterly toxicity testing as in I. C.1.b. (1) above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction and a WET limit.
 - (b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

Biological Monitoring (Outfall 003):

- (1) If the permittee elects to discharge process wastewater (evaporator condensate only) via outfall 003, then the following testing will be required for each discharge event until the first four discharge events have occurred:

Two acute toxicity tests using grab samples of final effluent from outfall 003. The acute tests shall be 48-hour static tests using Cyprinodon variegatus and Mysidopsis bahia, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} .
- (2) The following criterion shall be used in evaluating the toxicity test data generated in (1) above:

LC_{50} greater than or equal to 25% effluent concentration in six of the total of eight acute toxicity tests

- (3) If effluent from outfall 003 fails the above criterion it shall be considered to have demonstrated actual or potential toxicity. Accordingly, continued discharge of this effluent via outfall 003 shall be prohibited. In order to resume discharging from this outfall the permittee must:
- (a) assure the absence of actual or potential toxicity, or
 - (b) demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.

Whole Effluent Toxicity Effluent Limitation and Monitoring Requirements for Outfall 002 (Acute WET Limit)

- a. **The Whole Effluent Toxicity limit for outfall 002 shall be an LC_{50} greater than or equal to 7% or $TU_a = 14.58$ (acute toxic units).**
- b. **Commencing with the effective date of this permit, the permittee shall conduct quarterly acute toxicity tests using 24 hour flow-proportioned composite samples of final effluent from outfall 002. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute toxicity tests shall be 48-hour static tests using Mysidopsis bahia. The LC_{50} or TU_a shall be reported on the DMR for the month following the quarter in which the test is performed. Two copies of a detailed report concerning the conduct of the test shall accompany the results. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality, if requested by the permittee. Test protocols shall be submitted for approval no later than two months before the effective date of the limit.**
- c. In the event that quarterly WET testing as in b. above is not possible due to lack of operations at the facility, the permittee shall submit a written notice to the Department of Environmental Quality's Kilmarnock Regional Office with the DMR submitted for the month following the quarter in which the test was to have been performed.
- d. This permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

Table 1 Omega Protein Toxic Management Program

Outfall 002 – WET Limit – NOAEC=100% - eff 1/15/98 – QT – M. bahia

DUE	COMPLETED	M bahia NOAEC Result	Survival in 100% Effluent	LAB	Is test acceptable	Comments
Q1 – May-Jul 98	No discharge			All BMI, Inc.		
Q2 – Aug-Oct 98	8/5-7/98	NOAEC 100%	98		Y	2,3,4,5,17
Q3 – Nov-Jan 99	11/10-12/99	NOAEC <100%	0		N	17
Q4 – Feb-Apr 99	No discharge					
Q1 – May-Jul 99	?					
Q2 – Aug-Oct 99	9/22-24/99	NOAEC <100%	0		N	1,2,3,4,17
Q3 – Nov-Jan 00	11/10-12/99	NOAEC <100%	0		N	1,2,3,4,5,17
Q4 – Feb-Apr 00	No discharge					
Q1 – May-Jul 00	7/11-13/00	NOAEC < 100%	0		N	2, 17
Q2 – Aug-Oct 00	8/29-31/00	NOAEC 100%	95		Y	2,4,17
Q3 – Nov-Jan 01	11/7-9/00	NOAEC 100%	95		Y	1,2,3,4,6,7
Q4 – Feb-Apr 01	No discharge					
Q1 – May-Jul 01	7/20-22/01	NOAEC 100%	100		Y	2
Q2 – Aug-Oct 01	9/13-15/01	NOAEC 100%	100		Y	2,13
Q3 – Nov-Jan 02	11/14-16/01	NOAEC 100%	95		Y	3
Q4 – Feb-Apr 02	No discharge					
Q1 – May-Jul 02	7/24-26/02	NOAEC 100%	95		Y	2
Q2 – Aug-Oct 02	9/25-27/02	NOAEC 100%	100		Y	2,3
Q3 – Nov-Jan 03	1/13-15/02	NOAEC 100%	95		Y	2

Outfall 003 – Monitoring – Acute LC50 ≥ 100% - M. Bahia and C. variegatus – 4 sets of tests during discharge events.

TEST DATES	M. bahia LC ₅₀ result	C. variegatus LC ₅₀ result	Survival in 100% Eff	LAB	Comments
No Discharge, no samples					

Outfall 001 or 006 – Monitoring – Annual - Acute (LC50 ≥ 100%) and Chronic (NOEC ≥ 2%) with *C. variegatus*

DUE Dates	Outfall	TEST DATES	<i>C. variegatus</i> Acute Result	<i>C. variegatus</i> Chronic Result	% Survival in 100% Eff	LAB	Is test acceptable	Acute test Comments	Chronic test Comments
1997	001	8/28-30/97 acute 9/10-17/97 chronic	LC50 =>100%	NOEC = 2%	100 acute 75 chronic	BMI, Inc.	Acute: Y Chronic: N	2, 17,18	2,8,9
By Mar 17, 1998	001	6/24-26/98 acute 6/24/98-7/1/98 chronic	LC50 = >100	NOEC = 100%	65 acute 98 chronic	BMI, Inc.	Acute: Y Chronic: N	2,17,18	2,10
By Mar 17, 1999	001	9/25-27/99 acute 9/22-29/99 chronic	LC50 = >100	NOEC = 51%	98 acute 0 chronic	BMI, Inc.	Acute: Y Chronic: N	2,17,18	2, 11
By Mar 17, 2000	006	8/31/00-9/2/00 acute 8/29/00-9/5/00 chronic	LC50 = >100	NOEC = 100%	100 acute 97.5 chronic	BMI, Inc.	Acute: Y Chronic: Y	2, 17	2, 12
By Mar 17, 2001	006	9/13-15/01 acute 9/11-18/01 chronic	LC50 =>100	NOEC = 100%	90 Acute 93 Chronic	BMI, Inc.	Acute: Y Chronic: Y	2	2, 13
By Mar 17, 2002	006	6/26-27/02 acute 6/26/02-7/3/02 chronic	LC50 = >100	NOEC = 100%	90 Acute 100 Chronic	BMI, Inc.	Acute: Y Chronic: N	14	15, 16

Comments

- Used 2 replicates—need 4 replicates of 5 organisms
- Bring Salinity to 20 ppt plus or minus 2
- Sample lacked alkalinity and hardness test
- Replicates should contain only 5 organisms
- Results should be reported as NOAEC = 100%, not LC 50
- Typo error on test end date
- No result reported
- Third use of sample at 77 hours—exceeds 72 hr. holding time
- Chain of custody form for sample date 9/15-16/97 does not seem feasible. Sample was shipped at 2:30 PM 9/16/97 from Reedville and received 4:30 PM the same day in Blacksburg.
- Third use of sample noted as before sample even composited.
- Day 9/24/99, sample was 74.5 hr. old, 2.5 hours over 72 hr. limit for last use.
- Two samples lack hardness data.
- None of the samples have hardness data
- DO of 4.2 on 100% effluent should have prompted all containers to be aerated at test onset.
- Last use of sample exceeded 72 hr.
- No alkalinity and hardness data for one sample.
- Test run at 20 degrees C plus or minus 1 degree; this was ok prior to October, 2000
- Test organism used were Mysids, not Cyprinodons

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Spreadsheet for determination of WET test endpoints or WET limits														
2															
3															
4	Excel 97		Acute Endpoint/Permit Limit			Use as LC ₅₀ in Special Condition, as TU _a on DMR									
5	Revision Date: 12/05/01														
6	File: WETLIM10.xls		ACUTE			15.50329165	TU _a	LC ₅₀ =	7	% Use as	14.28	TU _a			
7	(MIX.EXE required also)														
8			ACUTE WLA _a			31.8	Note: Inform the permittee that if the mean of the data exceeds this TU _a : 4.35601216 a limit may result using WLA.EXE								
9															
10															
11			Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TU _c on DMR									
12															
13			CHRONIC			155.0329165	TU _c	NOEC =	1	% Use as	100.00	TU _c			
14			BOTH*			316.0000078	TU _c	NOEC =	1	% Use as	100.00	TU _c			
15	Enter data in the cells with blue type:		AML			155.0329165	TU _c	NOEC =	1	% Use as	100.00	TU _c			
16															
17	Entry Date:	01/14/03	ACUTE WLA _{a,c}			318	Note: Inform the permittee that if the mean of the data exceeds this TU _c : 63.7099508 a limit may result using WLA.EXE								
18	Facility Name:	Omega 001	CHRONIC WLA _c			106									
19	VPOES Number:	VA0003867	* Both means acute expressed as chronic												
20	Outfall Number:	1													
21			% Flow to be used from MIX.EXE			Diffuser /modeling study?									
22	Plant Flow:	3.5 MGD				Enter Y/N Y									
23	Acute 1Q10:	0 MGD	100 %			Acute 106 :1									
24	Chronic 7Q10:	0 MGD	100 %			Chronic 106 :1									
25															
26	Are data available to calculate CV? (Y/N)		N			(Minimum of 10 data points, same species, needed)						Go to Page 2			
27	Are data available to calculate ACR? (Y/N)		N			(NOEC < LC50, do not use greater/less than data)						Go to Page 3			
28															
29															
30	IWC _a	0.94339623	%	Plant flow/plant flow + 1Q10			NOTE: If the IWC _a is >33%, specify the								
31	IWC _c	0.94339623	%	Plan. flow/plant flow + 7Q10			NOAEC = 100% test endpoint for use								
32															
33	Dilution, acute	106	100/IWC _a												
34	Dilution, chronic	106	100/IWC _c												
35															
36	WLA _a	31.8	Instream criterion (0.3 TU _a) X's Dilution, acute												
37	WLA _c	106	Instream criterion (1.0 TU _c) X's Dilution, chronic												
38	WLA _{a,c}	318	ACR X's WLA _a - converts acute WLA to chronic units												
39															
40	ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)												
41	CV-Coefficient of variation	0.0	Default of 0.1 - if data are available, use tables Page 2)												
42	Constants eA	0.4100447	Default = 0.4												
43	eB	0.6010373	Default = 0.60												
44	eC	2.4334175	Default = 2.43												
45	eD	2.4334175	Default = 2.43 (1 samp)												
46			**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.												
47	LTA _{a,c}	130.680415	WLA _{a,c} X's eA												
48	LTA _c	63.7099538	WLA _c X's eB			Rounded NOEC's %									
49	MDL** with LTA _{a,c}	318.000008	TU _c	NOEC =	0.314465	(Protects from acute/chronic toxicity)									
50	MDL** with LTA _c	155.032917	TU _c	NOEC =	0.645024	(Protects from chronic toxicity)									
51	AML with lowest LTA	155.032917	TU _c	NOEC =	0.645024	Lowest LTA X's eD									
52															
53	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _c to TU _a														
54															
55	MDL with LTA _{a,c}	31.8000008	TU _a	LC50 =	3.144654	Rounded LC50's %									
56	MDL with LTA _c	15.5032917	TU _a	LC50 =	6.450243	LC50 = 4 %									
57															
58															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
79															
80		Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)													
81								Vertebrate			Invertebrate				
82		IF YOU HAVE AT LEAST 10 DATA POINTS THAT						IC ₂₅ Data			IC ₂₅ Data				
83		ARE QUANTIFIABLE (NOT "<" OR ">")									or				
84		FOR A SPECIES, ENTER THE DATA IN EITHER													
85		COLUMN "G" (VERTEBRATE) OR COLUMN						LC ₅₀ Data	LN of data		LC ₅₀ Data	LN of data			
86		"J" (INVERTEBRATE). THE "CV" WILL BE						*****			*****				
87		PICKED UP FOR THE CALCULATION IS						1	0		1	0			
88		BELOW. THE DEFAULT VALUES FOR eA,						2			2				
89		eB, AND eC WILL CHANGE IF THE "n" IS						3			3				
90		ANYTHING OTHER THAN 0.6.						4			4				
91								5			5				
92								6			6				
93								7			7				
94		Coefficient of Variation for effluent tests						8			8				
95								9			9				
96		CV =	0.6 (Default C.V.)				10			10					
97								11			11				
98		$\sigma^2 =$	0.3074847				12			12					
99		$\sigma =$	0.55451303				13			13					
100								14			14				
101		Using the log variance to develop eA						15			15				
102		(P. 100, step 2a of TSD)						16			16				
103		Z = 1.881 (97% probability stat from table)					17			17					
104		A =	-0.8892967				18			18					
105		eA =	0.41094469				19			19					
106								20			20				
107		Using the log variance to develop eB													
108		(P. 100, step 2b of TSD)						St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA		
109		$\sigma_A^2 =$	0.0861777				Mean	0	0	Mean	0	0			
110		$\sigma_A =$	0.29356038				Variance	0	0.000000	Variance	0	0.000000			
111		B =	-0.5060982				CV	0		CV	0				
112		eB =	0.60103733												
113															
114		Using the log variance to develop eC													
115		(P. 100, step 4a of TSD)													
116		$\sigma^2 =$	0.3074847												
117		$\sigma =$	0.55451303												
118		C =	0.88929666												
119		eC =	2.43341753												
120															
121		Using the log variance to develop eD													
122		(P. 100, step 4b of TSD)													
123		n =	1 This number will most likely stay as "1", for 1 sample/month.												
124		$\sigma_n^2 =$	0.3074847												
125		$\sigma_n =$	0.55451303												
126		D =	0.88929666												
127		eD =	2.43341753												
128															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
110															
111	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)														
112															
113	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results,														
114	acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute														
115	LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's >100% should not be used.														
116															
117	Table 1. ACR using Vertebrate data										Convert LC₅₀'s and NOEC's to Chronic TU's				
118											for use in WLA.EXE				
119											Table 3. ACR used: 10				
120	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use		Enter LC ₅₀	TUc	Enter NOEC	TUc		
121	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		1	NO DATA		NO DATA		
122	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		2	NO DATA		NO DATA		
123	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		3	NO DATA		NO DATA		
124	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		4	NO DATA		NO DATA		
125	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		5	NO DATA		NO DATA		
126	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		6	NO DATA		NO DATA		
127	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		7	NO DATA		NO DATA		
128	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		8	NO DATA		NO DATA		
129	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		9	NO DATA		NO DATA		
130	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		10	NO DATA		NO DATA		
131															
132	ACR for vertebrate data:										0				
133															
134	Table 1. Result:										Vertebrate ACR				
135	Table 2. Result:										Invertebrate ACR				
136											Lowest ACR				
137															
138	Table 2. ACR using Invertebrate data														
139															
140	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
141	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
142	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
143	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
144	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
145	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
146	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
147	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
148	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
149	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
150	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
151															
152	ACR for vertebrate data:										0				
153															
154															
155															
156	DILUTION SERIES TO RECOMMEND														
157															
158	Table 4.														
159															
160	Dilution series based on data mean														
161	Dilution series to use for limit														
162	Dilution factor to recommend:														
163															
164	Dilution series to recommend:														
165															
166															
167															
168															
169															
170	Extra dilutions if needed														
171															
172															

Cell: I9

Comment:

Cell: K18

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - " c " " $>$ ").

Cell: J22

Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment:

If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41

Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48

Comment:

See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62

Comment:

Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62

Comment:

Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117

Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119

Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TU_a. The calculation is the same: $100/\text{NOEC} = \text{TU}_c$ or $100/\text{LC50} = \text{TU}_a$.

Cell: C138

Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
2	Spreadsheet for determination of WET test endpoints or WET limits															
4	Excel 97				Acute Endpoint/Permit Limit			Use as LC ₅₀ in Special Condition, as TUa on DMR								
5	Revision Date: 12/05/01															
6	File: WETLIM10.xls				ACUTE	14.62574684	TUa	LC ₅₀ =	8	% Use as	42.30	TUa	14.6 rounded to 14			
7	(MDL.EXE required also)															
8					ACUTE WLA _a	30	Note: Inform the permittee that if the mean of the data exceeds this TUa: 4.10944543 a limit may result using WLA.EXE									
11					Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TUc on DMR								
13					CHRONIC	146.2574684	TU _c	NOEC =	1	% Use as	100.00	TU _c				
14					BOTH*	300.0000074	TU _c	NOEC =	1	% Use as	100.00	TU _c				
15	Enter data in the cells with blue type:				AML	146.2574684	TU _c	NOEC =	1	% Use as	100.00	TU _c				
17	Entry Date: 01/14/03				ACUTE WLA _{a,c}	300	Note: Inform the permittee that if the mean of the data exceeds this TUc: 60.1037272									
18	Facility Name: Omega Protein 002				CHRONIC WLA _c	100	a limit may result using WLA.EXE									
19	VPDES Number: VA0003867				* Both means acute expressed as chronic											
20	Outfall Number: 2															
22	Plant Flow: 0.25 MGD				% Flow to be used from MIX.EXE								Diffuser /modeling study?			
23	Acute 1Q10: NA MGD				100	%	Enter Y/N								Y	
24	Chronic 7Q10: NA MGD				100	%	Acute								100:1	
25							Chronic								100:1	
26	Are data available to calculate CV? (Y/N)				N	(Minimum of 10 data points, same species, needed)								Go to Page 2		
27	Are data available to calculate ACR? (Y/N)				N	(NOEC<LC50, do not use greater/less than data)								Go to Page 3		
30	IWC _a				1	%	Plant flow/plant flow + 1Q10								NOTE: If the IWC _a is >33%, specify the	
31	IWC _c				1	%	Plant flow/plant flow + 7Q10								NOAEC = 100% test/endpoint for use	
32	Dilution, acute				100	100/IWC _a										
33	Dilution, chronic				100	100/IWC _c										
36	WLA _a				30	Instream criterion (0.3 TUa) X's Dilution, acute										
37	WLA _c				100	Instream criterion (1.0 TUc) X's Dilution, chronic										
38	WLA _{a,c}				300	ACR X's WLA _a - converts acute WLA to chronic units										
40	ACR -acute/chronic ratio				10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)										
41	CV-Coefficient of variation				0.6	Default of 0.6 - if data are available, use tables Page 2)										
42	Constants eA				0.4109447	Default = 0.1										
43	eB				0.6010373	Default = 0.60										
44	eC				2.4334175	Default = 2.43										
45	eD				2.4334175	Default = 2.43 (1 samp)										
46					**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.											
47	LTA _{a,c}				123.28341	WLA _{a,c} X's eA										
48	LTA _c				60.10373	WLA _c X's eB								Rounded NOEC's %		
49	MDL** with LTA _{a,c}				300.000007	TU _c	NOEC =	0.333333	(Protects from acute/chronic toxicity)				NOEC =	1	%	
50	MDL** with LTA _c				146.257468	TU _c	NOEC =	0.683726	(Protects from chronic toxicity)				NOEC =	1	%	
51	AML with lowest LTA				146.257468	TU _c	NOEC =	0.683726	Lowest LTA X's eD				NOEC =	1	%	
52																
53	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _c to TU _a															
54																
55	MDL with LTA _{a,c}				30.0000007	TU _a	LC50 =	3.333333	%				Rounded LC50's	%		
56	MDL with LTA _c				14.6257468	TU _a	LC50 =	6.837258	%				LC50 =	4	%	
57													LC50 =	7	%	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
79	Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)														
80															
81															
82	IF YOU HAVE AT LEAST 10 DATA POINTS THAT					Vertebrate					Invertebrate				
83	ARE QUANTIFIABLE (NOT "<" OR ">")					IC ₂₅ Data					IC ₂₅ Data				
84	FOR A SPECIES, ENTER THE DATA IN EITHER					or					or				
85	COLUMN "G" (VERTEBRATE) OR COLUMN					LC ₅₀ Data					LN of data				
86	"J" (INVERTEBRATE). THE "CV" WILL BE					*****					*****				
87	PICKED UP FOR THE CALCULATIONS					1					1				
88	BELOW. THE DEFAULT VALUES FOR JA,					2					2				
89	eB, AND eC WILL CHANGE IF THE "CV" IS					3					3				
90	ANYTHING OTHER THAN 0.6.					4					4				
91						5					5				
92						6					6				
93						7					7				
94	Coefficient of Variation for effluent test					8					8				
95						9					9				
96	CV = 0.6 (Default 0.6)					10					10				
97						11					11				
98	$\sigma^2 = 0.3074847$					12					12				
99	$\sigma = 0.55451303$					13					13				
100						14					14				
101	Using the log variance to develop eA					15					15				
102	(P. 100, step 2a of TSD)					16					16				
103	Z = 1.881 (97% probability stat from table)					17					17				
104	A = -0.8892967					18					18				
105	eA = 0.41004469					19					19				
106						20					20				
107	Using the log variance to develop eB														
108	(P. 100, step 2b of TSD)					St Dev					NEED DATA				
109	$\sigma^2 = 0.0861777$					Mean					0				
110	$\sigma = 0.29358038$					Variance					0				
111	B = -0.5090962					CV					0				
112	eB = 0.60103733														
113															
114	Using the log variance to develop eC														
115	(P. 100, step 4a of TSD)														
116															
117	$\sigma^2 = 0.3074847$														
118	$\sigma = 0.55451303$														
119	C = 0.88929666														
120	eC = 2.43341753														
121															
122	Using the log variance to develop eD														
123	(P. 100, step 4b of TSD)														
124	n = 1 This number will most likely stay as "1", for 1 sample/month.														
125	$\sigma^2 = 0.3074847$														
126	$\sigma = 0.55451303$														
127	D = 0.88929666														
128	eD = 2.43341753														
129															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
110															
111	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)														
112															
113	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results,														
114	acute and chronic, tested at the same temperature, and the same species. The chronic NOEC must be less than the acute														
115	LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's >100% should not be used.														
116															
117	Table 1. ACR using Vertebrate data										Convert LC₅₀'s and NOEC's to Chronic TU's				
118											for use in WLA EXE				
119											ACR used: 10				
120											Table 3.				
121	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use		Enter LC ₅₀	TUc	Enter NOEC	TUc		
122	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		1	NO DATA		NO DATA		
123	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		2	NO DATA		NO DATA		
124	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		3	NO DATA		NO DATA		
125	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		4	NO DATA		NO DATA		
126	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		5	NO DATA		NO DATA		
127	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		6	NO DATA		NO DATA		
128	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		7	NO DATA		NO DATA		
129	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		8	NO DATA		NO DATA		
130	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		9	NO DATA		NO DATA		
131	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		10	NO DATA		NO DATA		
132	ACR for vertebrate data:								0		11	NO DATA		NO DATA	
133	Table 1. Result:								0		12	NO DATA		NO DATA	
134	Table 2. Result:								0		13	NO DATA		NO DATA	
135	Lowest ACR								Default to 10		14	NO DATA		NO DATA	
136															
137	Table 2. ACR using Invertebrate data														
138															
139	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use		20	NO DATA		NO DATA		
140	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		If WLA EXE determines that an acute limit is needed, you need to					
141	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		convert the TUc answer you get to TUa and then an LC ₅₀ ,					
142	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		enter it here:					
143	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA			NO DATA	%LC ₅₀			
144	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA			NO DATA	TUa			
145	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
146	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
147	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
148	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
149	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
150	ACR for vertebrate data:								0						
151															
152															
153	DILUTION SERIES TO RECOMMEND														
154															
155	Table 4.														
156															
157															
158															
159															
160															
161															
162															
163															
164															
165															
166															
167															
168															
169															
170															
171															
172															

Attachment 15

Cell: I9
Comment:

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" ">" ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment: If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment: See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment: Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment: Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:
Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACF, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUs. The calculation is the same: $100/\text{NOEC} = \text{TUc}$ or $100/\text{LC50} = \text{TUa}$.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

01 Jan 2000 11:11

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Spreadsheet for determination of WET test endpoints or WET limits														
2															
3															
4	Excel 97		Acute Endpoint/Permit Limit			Use as LC ₅₀ in Special Condition, as TU _a on DMR									
5	Revision Date: 12/05/01														
6	File: WETLIM10.xls		ACUTE			100% =	NOAEC	LC ₅₀ = NA		% Use as		NA	TU _a		
7	(MIX.EXE required also)		ACUTE WLA _a			0.6	Note: Inform the permittee that if the mean of the data exceeds this TU _a : 1.0 a limit may result using WLA EXE								
8															
9															
10															
11				Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TUC on DMR								
12															
13				CHRONIC			6.000000147	TU _c	NOEC =		17	% Use as		5.88	TU _c
14				BOTH*			6.000000147	TU _c	NOEC =		17	% Use as		5.88	TU _c
15				AML			6.000000147	TU _c	NOEC =		17	% Use as		5.88	TU _c
16	Enter data in the cells with blue type:														
17	Entry Date:		01/14/03		ACUTE WLA _{a,c}			6	Note: Inform the permittee that if the mean of the data exceeds this TUC: 2.46566808 a limit may result using WLA EXE						
18	Facility Name:		Omega 004/005		CHRONIC WLA _c			50							
19	VPDES Number:		VA0003867		* Both means acute expressed as chronic										
20	Outfall Number:		4/5												
21	% Flow to be used from MIX.EXE														
22	Plant Flow:		7.5 MGD		Diffuser /modeling study?										
23	Acute 1Q10:		0 MGD		Enter Y/N Y										
24	Chronic 7Q10:		0 MGD		Acute 2:1										
25					Chronic 50:1										
26	Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2														
27	Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3														
28															
29															
30	IWC _a		50 %		Plant flow/plant flow + 1Q10			NOTE: If the IWC _a is >33%, specify the							
31	IWC _c		2 %		Plant flow/plant flow + 7Q10			NOAEC = 100% test/endpoint for use							
32															
33	Dilution, acute		2		100/IWC _a										
34	Dilution, chronic		50		100/IWC _c										
35															
36	WLA _a		0.6		Instream criterion (0.3 TU _a) X's Dilution, acute										
37	WLA _c		50		Instream criterion (1.0 TUC) X's Dilution, chronic										
38															
39	WLA _{a,c}		6		ACR X's WLA _a - converts acute WLA to chronic units										
40															
41	ACR -acute/chronic ratio		10		LC50/NOEC (Default is 10 - if data are available, use tables Page 3)										
42	CV-Coefficient of variation		0.6		Default of 0.6 - if data are available, use tables Page 2)										
43	Constants eA		0.4109447		Default = 0.1										
44	eB		0.6010373		Default = 0.60										
45	eC		2.4334175		Default = 2.43										
46	eD		2.4334175		Default = 2.43 (1 samp)										
47	**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.														
48	LTA _{a,c}		2.4656682		WLA _{a,c} X's eA										
49	LTA _c		30.051865		WLA _c X's eB			Rounded NOEC's %							
50	MDL** with LTA _{a,c}		6.00000015		TU _a		NOEC =		16.666666		(Protects from acute/chronic toxicity)		NOEC = 17 %		
51	MDL** with LTA _c		73.1287342		TU _c		NOEC =		1.367452		(Protects from chronic toxicity)		NOEC = 2 %		
52	AML with lowest LTA		6.00000015		TU _c		NOEC =		16.666666		Lowest LTA X's eD		NOEC = 17		
53	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _a to TU _c														
54															
55	MDL with LTA _{a,c}		0.60000001		TU _a		LC50 =		166.666663 %		Use NOAEC=100%		LC50 = NA %		
56	MDL with LTA _c		7.31287342		TU _c		LC50 =		13.674515 %				LC50 = 14		
57															
58															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
50																
60	Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)															
61																
62	IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">")						Vertebrate		Invertebrate							
63	FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE "CV" WILL BE PICKED UP FOR THE CALCULATIONS						IC ₂₅ Data		IC ₂₅ Data							
64							or									
65							LC ₅₀ Data		LN of data		LC ₅₀ Data		LN of data			
66							*****		*****							
67							1		0		1		0			
68							2				2					
69							3				3					
70							4				4					
71							5				5					
72							6				6					
73							7				7					
74							8				8					
75							9				9					
76							10				10					
77							11				11					
78							12				12					
79							13				13					
80							14				14					
81							15				15					
82							16				16					
83							17				17					
84							18				18					
85							19				19					
86							20				20					
87	Using the log variance to develop eA (P. 100, step 2a of TSD)															
88	Z = 1.881 (97% probability stat from table)															
89	A = -0.8892967															
90	eA = 0.41094469															
91																
92																
93	Using the log variance to develop eB (P. 100, step 2b of TSD)						St Dev		NEED DATA		St Dev		NEED DATA		NEED DATA	
94	σ _A ² = 0.0861777						Mean		0		Mean		0		0	
95	σ _A = 0.29358038						Variance		0		Variance		0		0.000000	
96	B = -0.5060982						CV		0		CV		0			
97	eB = 0.60103733															
98																
99																
100																
101																
102	Using the log variance to develop eC (P. 100, step 4a of TSD)															
103																
104																
105																
106																
107																
108																
109																
110																
111																
112																
113																
114																
115																
116																
117																
118																
119																
120																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
11	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)															
12	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's >100% should not be used.															
116	Table 1. ACR using Vertebrate data										Convert LC₅₀'s and NOEC's to Chronic TU's					
117											for use in WLA EXE					
118											ACR used: 10					
119	Set #	LC₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use								
120	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	Enter LC₅₀	TUc	Enter NOEC	TUc				
121	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	1	NO DATA		NO DATA				
122	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	2	NO DATA		NO DATA				
123	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	3	NO DATA		NO DATA				
124	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	4	NO DATA		NO DATA				
125	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	5	NO DATA		NO DATA				
126	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	6	NO DATA		NO DATA				
127	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	7	NO DATA		NO DATA				
128	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	8	NO DATA		NO DATA				
129	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	9	NO DATA		NO DATA				
130	ACR for vertebrate data:								0	10	NO DATA		NO DATA			
131	Table 1. Result:								Vertebrate ACR	0	11	NO DATA		NO DATA		
132	Table 2. Result:								Invertebrate ACR	0	12	NO DATA		NO DATA		
133	Lowest ACR								Default to 10	13	NO DATA		NO DATA			
134	Table 2. ACR using Invertebrate data									14	NO DATA		NO DATA			
135										15	NO DATA		NO DATA			
136										16	NO DATA		NO DATA			
137										17	NO DATA		NO DATA			
138										18	NO DATA		NO DATA			
139										19	NO DATA		NO DATA			
140										20	NO DATA		NO DATA			
141	Set #	LC₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use								
142	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA	If WLA EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here:							
143	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
144	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
145	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
146	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
147	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
148	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
149	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
150	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
151	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA								
152	ACR for vertebrate data:								0							
153																
154																
155																
156	DILUTION SERIES TO RECOMMEND															
157	Table 4.								Monitoring	Limit						
158									% Effluent	TUc	% Effluent	TUc				
159	Dilution series based on data met:								40.6	2.4656681						
160	Dilution series to use for limit:									47	5.8823529					
161	Dilution factor to recommend:								0.6368435		0.4123106					
162	Dilution series to recommend:								100.0	1.00	100.0	1.00				
163									63.7	1.57	41.2	2.43				
164									40.6	2.47	17.0	5.88				
165									25.0	3.87	7.0	14.27				
166									16.45	6.08	2.9	34.60				
167	Extra dilutions if needed								10.48	9.55	1.2	83.92				
168									6.67	14.99	0.5	203.54				
169																
170																

Cell: I9

Comment:

Cell: K18

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22

Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment:

If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41

Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "L5", make sure you have selected "Y" in cell E20

Cell: L48

Comment:

See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62

Comment:

Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62

Comment:

Invertebrates are:
Ceriodaphnia dubia
Mystidopsis bahia

Cell: C117

Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119

Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an A/F, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUs. The calculation is the same: $100/\text{NOEC} = \text{TUc}$ or $100/\text{LC50} = \text{TUa}$.

Cell: C138

Comment: Invertebrates are:

Ceriodaphnia dubia
Mystidopsis bahia

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Spreadsheet for determination of WET test endpoints or WET limits														
2															
3															
4	Excel 97				Acute Endpoint/Permit Limit		Use as LC ₅₀ in Special Condition, as TU _a on DMR								
5	Revision Date: 12/05/01														
6	File: WETLIM10.xls				ACUTE 4.095209115 TU _a		LC ₅₀ =		25 % Use as		4.00 TU _a				
7	(MDX.EXE required also)														
8					ACUTE WLA _a		8.4		Note: Inform the permittee that if the mean of the data exceeds this TU _a :						
9									1.15084472 a limit may result using WLA.EXE						
10															
11					Chronic Endpoint/Permit Limit		Use as NOEC in Special Condition, as TU _c on DMR								
12															
13					CHRONIC 40.95209115 TU _c		NOEC =		3 % Use as		33.33 TU _c				
14					BOTH* 84.00000208 TU _c		NOEC =		2 % Use as		50.00 TU _c				
15	Enter data in the cells with blue type:				AML 40.95209115 TU _c		NOEC =		3 % Use as		33.33 TU _c				
16															
17	Entry Date:		02/21/03		ACUTE WLA _{a,c}		84		Note: Inform the permittee that if the mean of the data exceeds this TU _c :						
18	Facility Name:		Omega 003		CHRONIC WLA _c		28		16.8290436						
19	VPDES Number:		VA0003867		Both means acute expressed as chronic		a limit may result using WLA.EXE								
20	Outfall Number:		3												
21					% Flow to be used from MIX.EXE		Diffuser /modeling study?								
22	Plant Flow:		4 MGD				Enter Y/N								
23	Acute 1Q10:		0 MGD		100 %		Acute 28 :1								
24	Chronic 7Q10:		0 MGD		100 %		Chronic 28 :1								
25															
26	Are data available to calculate CV? (Y/N)		N		(Minimum of 10 data points, same species, needed)		Go to Page 2								
27	Are data available to calculate ACR? (Y/N)		N		(NOEC<LC50, do not use greater/less than data)		Go to Page 3								
28															
29															
30	IWC _a		3.57142857 %		Plant flow/plant flow + 1Q10		NOTE: If the IWC _a is >33%, specify the								
31	IWC _c		3.57142857 %		Plant flow/plant flow + 7Q10		NOAEC = 100% test/endpoint for use								
32															
33	Dilution, acute		28		100%/W _a C _a										
34	Dilution, chronic		28		100%/W _c C _c										
35															
36	WLA _a		8.4		Instream criterion (0.3 TU _a) X's Dilution, acute										
37	WLA _c		28		Instream criterion (1.0 TU _c) X's Dilution, chronic										
38	WLA _{a,c}		84		ACR X's WLA _a - converts acute WLA to chronic units										
39															
40	ACR -acute/chronic ratio		10		LC50/NOEC (Default is 10 - if data are available, use tables Page 3)										
41	CV-Coefficient of variation		0.6		Default of 0.6 - if data are available, use tables Page 2)										
42	Constants		eA		0.4100447 Default = 0.11										
43			eB		0.0010373 Default = 0.60										
44			eC		2.4334175 Default = 2.13										
45			eD		2.4334175 Default = 2.43 (1 samp)		**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA _{a,c} and MDL using it are driven by the ACR.								
46															
47	LTA _{a,c}		34.5193548		WLA _{a,c} X's eA										
48	LTA _c		16.8290444		WLA _c X's eB		Rounded NOEC's %								
49	MDL** with LTA _{a,c}		84.0000021		TU _a NOEC =		1.190476		(Protects from acute/chronic toxicity)		NOEC =		2 %		
50	MDL** with LTA _c		40.9520912		TU _c NOEC =		2.441878		(Protects from chronic toxicity)		NOEC =		3 %		
51	AML with lowest LTA		40.9520912		TU _c NOEC =		2.441878		Lowest LTA X's eD		NOEC =		3		
52															
53	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _a to TU _c														
54															
55	MDL with LTA _{a,c}		8.40000021		TU _a LC50 =		11.904762 %				LC50 =		12 %		
56	MDL with LTA _c		4.09520912		TU _c LC50 =		24.418777 %				LC50 =		25		
57															
58															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
59	Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)															
60																
61	IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">")						Vertebrate				Invertebrate					
62	FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.						IC ₂₅ Data				IC ₂₅ Data					
63							or				or					
64							LC ₅₀ Data		LN of data		LC ₅₀ Data		LN of data			
65							*****				*****					
66							1		0		1		0			
67							2				2					
68							3				3					
69							4				4					
70							5				5					
71							6				6					
72							7				7					
73							8				8					
74	Coefficient of Variation for effluent tests						9				9					
75	CV =						10				10					
76	0.6 (Default 0.6)						11				11					
77							12				12					
78	σ ² =						13				13					
79	0.3074847						14				14					
80	σ =						15				15					
81	0.55451303						16				16					
82	Using the log variance to develop eA						17				17					
83	(P. 100, step 2a of TSD)						18				18					
84	Z = 1.881 (97% probability stat from table)						19				19					
85	A =						20				20					
86	-0.8892967															
87	eA =															
88	0.41094469															
89	Using the log variance to develop eB						St Dev		NEED DATA		St Dev		NEED DATA			
90	(P. 100, step 2b of TSD)						Mean		0		Mean		0			
91	σ _A ² =						Variance		0		Variance		0		0.000000	
92	0.0861777						CV		0		CV		0			
93	σ _A =															
94	0.29356038															
95	B =															
96	-0.5060982															
97	eB =															
98	0.60103733															
99	Using the log variance to develop eC															
100	(P. 100, step 4a of TSD)															
101	σ ² =															
102	0.3074847															
103	σ =															
104	0.55451303															
105	C =															
106	0.88929666															
107	eC =															
108	2.43341753															
109	Using the log variance to develop eD															
110	(P. 100, step 4b of TSD)															
111	n =															
112	1 This number will most likely stay as "1", for 1 sample/month.															
113	σ _n ² =															
114	0.3074847															
115	σ _n =															
116	0.55451303															
117	D =															
118	0.88929666															
119	eD =															
120	2.43341753															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
114	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)														
115	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's >100% should not be used.														
116	Table 1. ACR using Vertebrate data										Convert LC ₅₀ 's and NOEC's to Chronic TU's				
117											for use in WLA EXE				
118											Table 3. ACR used: 10				
119	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use		Enter LC ₅₀	TUc	Enter NOEC	TUc		
120	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		1	NO DATA		NO DATA		
121	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		2	NO DATA		NO DATA		
122	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		3	NO DATA		NO DATA		
123	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		4	NO DATA		NO DATA		
124	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		5	NO DATA		NO DATA		
125	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		6	NO DATA		NO DATA		
126	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		7	NO DATA		NO DATA		
127	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		8	NO DATA		NO DATA		
128	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		9	NO DATA		NO DATA		
129	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA		10	NO DATA		NO DATA		
130	ACR for vertebrate data:								0		11	NO DATA		NO DATA	
131	Table 1. Result:								Vertebrate ACR	0	12	NO DATA		NO DATA	
132	Table 2. Result:								vertebrate ACR	0	13	NO DATA		NO DATA	
133									Lowest ACR	Default to 10	14	NO DATA		NO DATA	
134	Table 2. ACR using Invertebrate data														
135	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
136	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
137	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
138	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
139	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
140	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
141	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
142	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
143	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
144	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
145	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
146	ACR for vertebrate data:								0						
147	DILUTION SERIES TO RECOMMEND														
148	Table 4.				Monitoring		Limit								
149					% Effluent	TUc	% Effluent	TUc							
150	Dilution series based on data meet				5.9	16.829044	.3	33.333333							
151	Dilution series to use for limit														
152	Dilution factor to recommend:				0.2437644		0.1732051								
153	Dilution series to recommend:				100.0	1.00	100.0	1.00							
154					24.4	4.10	17.3	5.77							
155					5.9	16.83	3.0	33.33							
156					1.4	69.04	0.5	192.45							
157					0.35	283.22	0.1	1111.11							
158	Extra dilutions if needed				0.09	1161.85	0.0	6415.00							
159					0.02	4766.27	0.0	37037.04							
160															
161															
162															

Cell: I9

Comment:

Cell: K18

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22

Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment:

If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C45

Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.8", make sure you have selected "Y" in cell E20

Cell: L48

Comment:

See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62

Comment:

Vertebrates are:

Pimephales promelas

Oncorhynchus mykiss

Cyprinodon variegatus

Cell: J62

Comment:

Invertebrates are:

Ceriodaphnia dubia

Mysidopsis bahia

Cell: C117

Comment: Vertebrates are:

Pimephales promelas

Cyprinodon variegatus

Cell: M119

Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TU_a. The calculation is the same: $100\text{NOEC} = \text{TUc}$ or $100\text{LC50} = \text{TUa}$.

Cell: C138

Comment: Invertebrates are:

Ceriodaphnia dubia

Mysidopsis bahia

ATTACHMENT 16

NPDES No.: V A 000 3 8 6 7 1

Facility Name:

OMEGA PROTEIN

City: REEDVILLE

Receiving Water: COCKRELL'S CREEK

Reach Number:

☐ Score change, but no status change

☐ Deletion

Omega Protein Attachment

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

☐ YES; score is 600 (stop here) ☒ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
☒ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code:

Primary SIC Code: 2077

Other SIC Codes:

Industrial Subcategory Code: 0 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	15	<input type="checkbox"/> 7.	7	35
<input checked="" type="checkbox"/> 1.	1	5	<input type="checkbox"/> 4.	4	20	<input type="checkbox"/> 8.	8	40
<input type="checkbox"/> 2.	2	10	<input type="checkbox"/> 5.	5	25	<input type="checkbox"/> 9.	9	45
			<input type="checkbox"/> 6.	6	30	<input type="checkbox"/> 10.	10	50

Code Number Checked: 01

Total Points Factor 1: 15

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A—Wastewater Flow Only Considered

Wastewater Type (See Instructions)	Code	Points
Type I: Flow < 5 MGD	<input type="checkbox"/> 11	0
Flow 5 to 10 MGD	<input type="checkbox"/> 12	10
Flow > 10 to 50 MGD	<input type="checkbox"/> 13	20
Flow > 50 MGD	<input type="checkbox"/> 14	30
Type II: Flow < 1 MGD	<input type="checkbox"/> 21	10
Flow 1 to 5 MGD	<input type="checkbox"/> 22	20
Flow > 5 to 10 MGD	<input type="checkbox"/> 23	30
Flow > 10 MGD	<input type="checkbox"/> 24	50
Type III: Flow < 1 MGD	<input type="checkbox"/> 31	0
Flow 1 to 5 MGD	<input type="checkbox"/> 32	10
Flow > 5 to 10 MGD	<input type="checkbox"/> 33	20
Flow > 10 MGD	<input type="checkbox"/> 34	30

Section B—Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow	Code	Points
TYPE I/III:	< 10%	<input type="checkbox"/> 41	0
	≥ 10% to < 50%	<input type="checkbox"/> 42	10
	≥ 50%	<input type="checkbox"/> 43	20
Type II:	< 10%	<input type="checkbox"/> 51	0
	≥ 10% to < 50%	<input type="checkbox"/> 52	20
	≥ 50%	<input type="checkbox"/> 53	30

max 30 day avg flows

*3.821 MGD
002 0.249
003 0.4
004/05 7.1
11.569 total
4.469 MGD process WW → type II since
61%*

Code Checked from Section A or B: 214

Total Points Factor 2: 1510

FACTOR 3: CONVENTIONAL POLLUTANTS
(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ☒ BOD ☐ COD ☐ Other: _____

Permit Limits: (check one)

001 1755 kg/d $\times 2.2 = 3861$

002 271 $= 596.2$

003 4296 $= 9451.2$

13,908.4 lb/day

<100 lbs/day
100 to 1000 lbs/day
>1000 to 3000 lbs/day
>3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Checked: 3

Points Scored: 15

B. Total Suspended Solids (TSS)

Permit Limits: (check one)

001 655 kg/d $\times 2.2 = 1441$

002 168 $\times 2.2 = 369.6$

003 114 $\times 2.2 = 250.8$

2061.4 lb/day total

<100 lbs/day
100 to 1000 lbs/day
>1000 to 5000 lbs/day
>5000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Checked: 3

Points Scored: 15

C. Nitrogen Pollutant: (check one) ☒ Ammonia ☐ Other: _____

Permit Limits: (check one)

001 NL

002 38.0 mg/L $\times 3.785 = 143.8$

003 35.8 mg/L $\times 3.785 = 135.3$

004/005 NL

279.33 $\times 2.2 = 614.53$ lb/day

Nitrogen Equivalent
<300 lbs/day
300 to 1000 lbs/day
>1000 to 3000 lbs/day
>3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Checked: 2

Points Scored: 10

Total Points Factor 3: 40

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☐ YES (If yes, check toxicity potential number below)

☒ NO (If no, go to Factor 3)

Determine the human health toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column — check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	0	<input type="checkbox"/> 7.	7	15
<input type="checkbox"/> 1.	1	0	<input type="checkbox"/> 4.	4	0	<input type="checkbox"/> 8.	8	20
<input type="checkbox"/> 2.	2	0	<input type="checkbox"/> 5.	5	5	<input type="checkbox"/> 9.	9	25
			<input type="checkbox"/> 6.	6	10	<input type="checkbox"/> 10.	10	30

Code Number Checked: 1

Total Points Factor 4: 0

FACTOR 5: Water Quality Factor

- A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge?

<input checked="" type="checkbox"/> Yes	Code 1	Points 10
<input type="checkbox"/> No	Code 2	Points 0

- B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

<input type="checkbox"/> Yes	Code 1	Points 0
<input checked="" type="checkbox"/> No	Code 2	Points 5

- C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

<input checked="" type="checkbox"/> Yes	Code 1	Points 10
<input type="checkbox"/> No	Code 2	Points 0

Code Number Checked: A | 1 | B | 2 | C | 1 |
 Points Factor 5: A | 10 | + B | 5 | + C | 10 | = | 25 | TOTAL

FACTOR 6: Proximity to Near Coastal Waters

- A. Base Score: Enter flow code here (from Factor 2): | 2 | 4 |

Enter the multiplication factor that corresponds to the flow code: | 1 | 1 |

Check appropriate facility HPRI Code (from PCS):

	HPRI #	Code	HPRI Score
<input type="checkbox"/>	1	1	20
<input type="checkbox"/>	2	2	0
<input checked="" type="checkbox"/>	3	3	30
<input type="checkbox"/>	4	4	0
<input type="checkbox"/>	5	5	20

Flow Code	Multiplication Factor
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked: | 3 |

Base Score: (HPRI Score) | 30 | x (Multiplication Factor) | 1 | = | 30 | (TOTAL POINTS)

- B. Additional Points — NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see Instructions) or the Chesapeake Bay?

<input checked="" type="checkbox"/> Yes	Code 1	Points 10
<input type="checkbox"/> No	Code 2	Points 0

- C. Additional Points — Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

<input type="checkbox"/> Yes	Code 1	Points 10
<input type="checkbox"/> No	Code 2	Points 0

Code Number Checked: A | 3 | B | 1 | C | 2 |
 Points Factor 6: A | 30 | + B | 10 | + C | 10 | = | 50 | TOTAL

Factor	Description	Total Points
1	Toxic Pollutant Potential	<u>5</u>
2	Flow/Streamflow Volume	<u>50</u>
3	Conventional Pollutants	<u>40</u>
4	Public Health Impacts	<u>0</u>
5	Water Quality Factors	<u>25</u>
6	Proximity to Near Coastal Waters	<u>40</u>
TOTAL (Factors 1 through 6)		<u>160</u>

S1. Is the total score equal to or greater than 80? ☒ Yes (Facility is a major) ☐ No

S2. If the answer to the above question is no, would you like this facility to be discretionary major?

☐ No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason: _____

NEW SCORE: 160

OLD SCORE: 109.5

the big difference was a change to Factor 2, from category III to category II. I did not include contact cooling water or process waste water previously.

D. M. DiRosca
 Permit Reviewer's Name

(804) 435-3181
 Phone Number

2-10-03
 Date

ATTACHMENT 17

Proposed Barge Loading Facility at Reedville
October 6, 2003

The proposed barge loading facility will be located near the old, tall brick stack that is a landmark in the Cockrell Creek/Reedville area. The stack can be seen from great distances as it is located on the end of a thin peninsula into Cockrell Creek. The peninsula separates the Omega Plant area from the Main Street of Reedville and marks the location of a former fish factory.

The peninsula is oriented in an east-west direction, extending out from the east bank of Cockrell Creek. The location of the proposed barge loading facility is on the south side of the peninsula, near the tall brick stack. There is an existing dock structure at a small "house like" building. The proposed barge loading facility will utilize the existing dock structure. The small building is located at the western end of an existing long warehouse that also is a remnant of the former fish factory.

The barge loading facility will consist of a hopper, a conveyor and a gravity drop for loading the barge. The hopper will be located on land to receive meal from end dumping trucks. The overhead enclosed conveyor will extend from the hopper, over water to the barge. The conveyed meal will be dropped through chutes or socks to control the fall of meal into the barge.

Omega Protein expects to load approximately 5000 to 6000 tons of meal per year into barges. The loading rate for barges will be about 50 tons per hour. The receiving rate will be about two trucks per hour—each trucks holds 23.5 tons. Therefore, assuming 6000 tons per year at a load rate of 50 tons per hour, the loading facility will only operate about 120 hours per year.

EPA's manual AP-42, labeled "Compilation of Air Pollutant Emission Factors" provides emission factors for total particulates, PM, and particulates of airborne diameters of 10 or less microns, PM₁₀. The relevant factors of pounds emission per ton are as follows:

	PM	PM ₁₀
Meal Receiving, Straight Truck	0.18	0.059
Grain Shipping, Barge	0.016	0.004

Regarding the potential impact of particulates with respect to water issues, we should use the PM factors. The PM₁₀ particulates will become airborne but will eventually fall. Therefore, the worst case would assume that particulates from the truck operations would fall to the ground and the barge operations would fall into the water.

The quantity of meal released becomes a simple calculation:

Total meal released per year over land is $6000 \times 0.18 = 1080$ pounds

Total meal released per year over water is $6000 \times 0.016 = 96$ pounds

This meal is sold commercially for feeding aquaculture, cattle, poultry, pets, etc. Therefore, the larger particulates are readily consumed by fish when they fall into the water. As to the amounts of particulates that would contribute to a biological oxygen demand (BOD), perhaps the PM10 particulates and some of the larger particulates, say a worst case of 48 pounds per year, a negligible amount it would appear.

The particulates that fall to the land would be subject to storm water runoff into the Cockrell Creek. We propose that Best Management Practices be implemented to minimize their exposure to storm water runoff.



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No. VA0003867

Effective Date: December 2, 2005

Expiration Date: December 1, 2010

AUTHORIZATION TO DISCHARGE UNDER THE VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM

AND

THE VIRGINIA STATE WATER CONTROL LAW

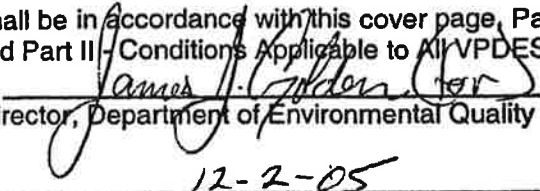
In compliance with the provisions of the Clean Water Act as amended and pursuant to the State Water Control Law and regulations adopted pursuant thereto, the following owner is authorized to discharge in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit.

OWNER:	Omega Protein, Inc.
FACILITY NAME:	Omega Protein, Inc.
CITY:	Reedville
COUNTY:	Northumberland
FACILITY LOCATION:	End of VSH 659, Reedville, VA. 22539

The owner is authorized to discharge to the following receiving stream:

STREAM:	Cockrell Creek and Chesapeake Bay
RIVER BASIN:	Ches Bay/Atl/Sm Coastal
RIVER SUBBASIN:	N/A
SECTION:	2
CLASS:	II
SPECIAL STANDARDS:	a

The authorized discharge shall be in accordance with this cover page, Part I - Effluent Limitations and Monitoring Requirements and Part II - Conditions Applicable to All VPDES Permits, as set forth herein.


Director, Department of Environmental Quality

12-2-05
Date

Omega Protein, Inc.

PART I
CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 001.

Such discharges shall be limited and monitored at outfall 001 by the permittee as specified below:

Such discharges shall be limited and monitored at outfall 001 by the permittee as specified below.

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA		NA	NL	Cont.	Estimate
BOD ₅ ³	1700 kg/d		NA		NA	3100 kg/d	3/Week	24-HC
Total Suspended Solids ³ (TSS)	650 kg/d		NA		NA	1600 kg/d	3/Week	24-HC
Oil & Grease	370 kg/d		NA		NA	680 kg/d	3/Week	Grab
pH (Standard Units)	NA		NA		6.0	9.0	3/Week	Grab
Total Phosphorus ³	2.0 mg/l	23 kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Total Phosphorus* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Calendar year (kg/calendar year)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Orthophosphate ³	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Total Nitrogen ^{3,5}	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	Calculated
Total Nitrogen* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Calendar year (kg/calendar year)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Total Kjeldahl Nitrogen (as N) ³	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Nitrate plus Nitrite (as N) ³	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Ammonia-Nitrogen ³	NL mg/l		NA		NA	NL mg/l	2/Month	24-HC
Cyanide	96 ug/l		NA		NA	110 ug/l	2/Month	Grab
Total Residual Chlorine ^{3,4}	580 ug/l		NA		NA	1200 ug/l	1/Day	Grab
Temperature (degrees C)	NA		NA		NA	50	1/Day	Immersion Stabilization

NL = No Limitation, monitoring only

NA = Not Applicable

*See Part I. B.21. for nutrient reporting requirements.

- There shall be no discharge of floating solids or visible foam in other than trace amounts.
- See Part I.B.1 for compliance reporting requirements.
- This limit will become effective upon the submittal to and DEQ approval of a plan and schedule for the addition of chlorine associated with the cyanide removal process. See Special Condition Part I.B.13.
- Total Nitrogen, which is the sum of Total Kjeldahl Nitrogen and Nitrate plus Nitrite, shall be derived from the sum of those tests.

Omega Protein, Inc.

PART I
AERATED LAGOONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 002.

Such discharges shall be limited and monitored at outfall 002 by the permittee as specified below:

Such discharges shall be limited and monitored at outfall 002 by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE	MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA	NA	NL	Cont.	Measured
Temperature (°C)	NL		NA	NA	NL	2/Week	Immersion Stabilization
BOD ₅ ⁸ (Kg/d)	470 kg/d		NA	NA	840 kg/d	2/Month	24-HC
Total Suspended Solids ⁸ (Kg/d)	160 kg/d		NA	NA	410 kg/d	2/Month	24-HC
Oil and Grease	25 kg/d		NA	NA	46 kg/d	2/Month	Grab
Ammonia ⁸	38 mg/l		NA	NA	45 mg/l	2/Month	24-HC
Toxicity Whole Effluent (WET) (TU _a) ¹¹	NA		NA	NA	14 acute toxic units	1/3 Months	24-HC
Total Nitrogen ^{8,10}	NL mg/l	NL kg/d	NA kg/d	NA kg/d	NA	1/Week	Calculated

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Total Nitrogen* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Calendar Year (kg/calendar year)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Total Kjeldahl Nitrogen ^B (as N)	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Nitrate plus Nitrite (as N) ^B	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Total Phosphorus ^{B,9}	2.0 mg/l	1.9 kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Total Phosphorus* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Total Phosphorus* - Calendar year (kg/year)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Orthophosphate ⁸	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Fecal Coliform N/100 ml ⁹	200 Geometric mean		NA		NA	NA	1/Week between 10 A.M. and 4 P.M.	Grab
enterococci N/100 ml ⁹	35 Geometric mean		NA		NA	NA	1/Week between 10 A.M. and 4 P.M.	Grab
pH (Standard Units)	NA		NA		6.0	9.0	2/Week	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

*See Part I.B.21 for nutrient reporting requirements.

7. There shall be no discharge of floating solids or visible foam in other than trace amounts.
8. Part I.B.1 for compliance reporting requirements.
9. Schedule of Compliance applies for enterococci, Fecal Coliform and Total Phosphorus: See Part I.B.16 and I.B.5.
10. Total Nitrogen, which is the sum of Total Kjeldahl Nitrogen and Nitrate plus Nitrite, shall be derived from the sum of those tests.

11. Whole Effluent Toxicity Effluent Limitation and Monitoring Requirements (Acute WET Limit)

- a. Commencing with the effective date of this permit, the permittee shall conduct quarterly acute toxicity tests using 24 hour flow-proportioned composite samples of final effluent from outfall 002. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute toxicity tests shall be 48-hour static tests using *Mysidopsis bahia*. The TU_a shall be reported on the DMR for the month following the quarter in which the test is performed. Express the result as TU_a (Acute Toxic Units) by dividing 100/LC₅₀. Two copies of a detailed report concerning the conduct of the test shall accompany the results. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality, if requested by the permittee. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.
- b. In the event that quarterly WET testing as in a. above is not possible due to lack of operations at the facility, the permittee shall submit a written notice to the Department of Environmental Quality with the DMR submitted for the month following the quarter in which the test was to have been performed.
- c. This permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

PART I

EVAPORATOR CONDENSATE

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

12. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 003.

Such discharges shall be limited and monitored at outfall 003 by the permittee as specified below and in Special Condition Part I.B.2 (Page 11 of 23):

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA		NA	NL	Cont.	Est.
BOD ₅ ¹⁴	4300 kg/d		NA		NA	7700 kg/d	2/Month	24-HC
Total Suspended Solids ¹⁴ (TSS)	110 kg/d		NA		NA	280 kg/d	2/Month	24-HC
Oil & Grease	430 kg/d		NA		NA	780 kg/d	2/Month	Grab
pH (Standard Units)	NA		NA		6.0	9.0	2/Month	Grab
Ammonia ¹⁴ (mg/l)	37 mg/l		NA		NA	45 mg/l	2/Month	24-HC
Total Phosphorus ¹⁴	2.0 mg/l	3.0 kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Total Phosphorus* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* (kg/calendar year)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Orthophosphate ¹⁴	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Total Kjeldahl Nitrogen ¹⁴ (as N)	NL mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Nitrate plus Nitrite (as N) ¹⁴	NL Mg/l	NL kg/d	NA mg/l	NA kg/d	NA	NA	1/Week	24-HC
Total Nitrogen ^{14,15}	NL mg/l	NL kg/d	NA Mg/l	NA Kg/d	NA	NA	1/Week	Calculated
Total Nitrogen* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Calendar Year (kg/yr)	NA	NA	NA	NA	NA	NL	1/Year	Calculated
Dissolved Oxygen (mg/l)	NL		NA		NA	NL	1/Day	Grab
Copper, Dissolved ¹⁴ (ug/l)	NL		NA		NA	NL	1/Month	Grab
Temperature (°C)	NL		NA		NA	NL	1/Day	Immersion Stabilization

NL = No Limitation, monitoring only

NA = Not Applicable

* See Part I.B.21. for nutrient reporting requirements.

13. There shall be no discharge of floating solids or visible foam in other than trace amounts.

14. See Part I.B.1 for compliance reporting requirements.

15. Total Nitrogen, which is the sum of Total Kjeldahl Nitrogen and Nitrate plus Nitrite, shall be derived from the sum of those tests.

Omega Protein, Inc.

PART I

ANNUAL NUTRIENT LOADING LIMITATIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

16. During the period beginning with the conclusion of the schedule of compliance for nutrient loadings, and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 996. The data to be reported for Outfall 996 shall be calculated as the sum of nutrients from 001, 002 and 003.

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FRE-QUENCY	SAMPLE TYPE
Total Nitrogen* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Nitrogen* - Calendar Year (kg/yr)	NA	NA	NA	NA	NA	9620	1/Year	Calculated
Total Phosphorus* - Monthly (kg/month)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Year to Date (kg/year)	NA	NA	NA	NA	NA	NL	1/Month	Calculated
Total Phosphorus* - Calendar Year (kg/yr)	NA	NA	NA	NA	NA	721	1/Year	Calculated

*See Part I.D.21 for nutrient reporting requirements.

17. Total Nitrogen, which is the sum of Total Kjeldahl Nitrogen and Nitrates plus Nitrites, shall be derived from the results of those tests.
18. See Part I.B.16. for Schedule of Compliance. Effluent monitoring and reporting is required upon effective date of the permit.

Omega Protein, Inc.

PART I

NON-CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

19. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall number 995 – which is 004 and 005 combined.
Such discharges shall be limited and monitored at outfall 995 as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL	NA	NA	NL	Cont.	Estimate
Temperature (°C)	NL	NA	NA	45	1/Day	Immersion Stabilization
Total Dissolved Zinc ²² (ug/l)	NL	NA	NA	NL	1/Month	Grab
Total Recoverable Copper ²¹ (ug/l)	19	NA	NA	19	1/Month	24-HC
Total Recoverable Silver ^{21, 22} (ug/l)	4.0	NA	NA	4.0	1/Month	24-HC
pH (Standard Units)	NA	NA	6.0	9.0	5/Week	Grab

NL = No Limitation, monitoring only
NA = Not Applicable

20. There shall be no discharge of floating solids or visible foam in other than trace amounts.
21. Schedule of Compliance applies for Total Recoverable Copper and Total Recoverable Silver: Also see Part I.B.16.
22. See Part I.B.1. for compliance reporting requirements.

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville VA 22539
FACILITY
LOCATION 610 Menhaden Rd

Industrial Major 10/12/2005

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS BEFORE COMPLETING THIS FORM.

VA0003867			001			
PERMIT NUMBER			DISCHARGE NUMBER			
MONITORING PERIOD						
YEAR	MO	DAY	TO	YEAR	MO	DAY

FROM

TC

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION			NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
001 FLOW	REPORTD				*****	*****	*****			
	REQRMNT	NL	NL	MGD	*****	*****	*****			
002 PH	REPORTD	*****	*****			*****			CONT	EST
	REQRMNT	*****	*****		6.0	*****	9.0	SU		
003 BOD5	REPORTD				*****	*****	*****		3D/W	GRAB
	REQRMNT	1700	3100	KG/D	*****	*****	*****			
004 TSS	REPORTD				*****	*****	*****		3D/W	24HC
	REQRMNT	650	1600	KG/D	*****	*****	*****			
005 CL2, TOTAL	REPORTD	*****	*****		*****				3D/W	24HC
	REQRMNT	*****	*****		*****	580	1200	UG/L		
012 PHOSPHORUS, TOTAL (AS P)	REPORTD		*****		*****		*****		1/DAY	GRAB
	REQRMNT	23	*****	KG/D	*****	2.0	*****	MG/L		
013 NITROGEN, TOTAL (AS N)	REPORTD		*****		*****		*****		1/W	24HC
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		
018 CYANIDE, TOTAL (AS CN)	REPORTD	*****	*****		*****				1/W	CALC
	REQRMNT	*****	*****		*****	96	110	UG/L		
ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS										

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE		
I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (Penalties under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.)				TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	YEAR	MO.	DAY
				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE			
				TYPED OR PRINTED NAME	SIGNATURE		YEAR	MO.	DAY

PERMITTEE NAME/ADDRESS(INCLUDE
FACILITY NAME/LOCATION IF DIFFERENT)

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville VA 22539
FACILITY LOCATION 610 Menhaden Rd

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867	001					
PERMIT NUMBER	DISCHARGE NUMBER					
MONITORING PERIOD						
YEAR	MO	DAY	TO	YEAR	MO	DAY

Industrial Major

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen

VA 23060

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS
BEFORE COMPLETING THIS FORM.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
039 AMMONIA, AS N	REPORTD	*****	*****		*****					2/M	24HC
	REQRMNT	*****	*****		*****	NL	NL	MG/L			
068 TKN (N-KJEL)	REPORTD		*****		*****					1/W	24HC
	REQRMNT	NL	*****		*****	NL	*****	MG/L			
080 TEMPERATURE, WATER (DEG. C)	REPORTD	*****	*****		*****	*****	50	C		1/DAY	IS
	REQRMNT	*****	*****		*****		*****				
389 NITRITE+NITRATE-N, TOTAL	REPORTD		*****		*****					1/W	24HC
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L			
500 OIL & GREASE	REPORTD				*****	*****	*****			3D/W	GRAB
	REQRMNT	370	680	KG/D	*****	*****	*****				
791 NITROGEN, TOTAL (AS N) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/MO	*****	*****	*****				
792 NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****			1/YR	CALC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/MO	*****	*****	*****				

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

OPERATOR IN RESPONSIBLE CHARGE				DATE		
TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	TELEPHONE	YEAR	MO.	DAY
PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT						
TYPED OR PRINTED NAME	SIGNATURE			YEAR	MO.	DAY

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.)

PERMITTEE NAME/ADDRESS(INCLUDE
FACILITY NAME/LOCATION IF DIFFERENT)

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville VA 22539
FACILITY LOCATION 610 Menhaden Rd

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867			001		
PERMIT NUMBER			DISCHARGE NUMBER		
MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY

FROM

TO

Industrial Major 10/19/2005

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
794 PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
795 ORTHOPHOSPHATE (AS P)	REPORTD		*****		*****		*****			1/YR	CALC
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L			
805 NITROGEN, TOTAL (AS N) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****			1/W	24HC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
806 PHOSPHORUS, TOTAL (AS P) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
	REPORTD									1/M	CALC
	REQRMNT										
	REPORTD									*****	
	REQRMNT										
	REPORTD									*****	
	REQRMNT										
	REPORTD									*****	
	REQRMNT										
	REPORTD									*****	
	REQRMNT										
ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS										*****	

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE								
<p>I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (Penalties under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.)</p>				TYPED OR PRINTED NAME			SIGNATURE			CERTIFICATE NO.			YEAR	MO.	DAY
				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT						TELEPHONE					
				TYPED OR PRINTED NAME			SIGNATURE						YEAR	MO.	DAY

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COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867	002
PERMIT NUMBER	DISCHARGE NUMBER
MONITORING PERIOD	
YEAR MO DAY	YEAR MO DAY
FROM	TO

Industrial Major 10/12/2005
DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)
Piedmont Regional Office
4949-A Cox Road
Glen Allen VA 23060

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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
001 FLOW	REPORTD				*****	*****	*****				
	REQRMNT	NL	NL	MGD	*****	*****	*****			CONT	MEAS
002 PH	REPORTD	*****	*****			*****					
	REQRMNT	*****	*****		6.0	*****	9.0	SU		2D/W	GRAB
003 BOD5	REPORTD				*****	*****	*****				
	REQRMNT	470	840	KG/D	*****	*****	*****			2/M	24HC
004 TSS	REPORTD				*****	*****	*****				
	REQRMNT	160	410	KG/D	*****	*****	*****			2/M	24HC
006 COLIFORM, FECAL	REPORTD	*****	*****		*****		*****				
	REQRMNT	*****	*****		*****	200	*****	N/CML		1/W	GRAB
012 PHOSPHORUS, TOTAL (AS P)	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
013 NITROGEN, TOTAL (AS N)	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		2/M	CALC
039 AMMONIA, AS N	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	38	45	MG/L		2/M	24HC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE		DATE					
				TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	YEAR	MO. DAY			
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DISCHARGE MONITORING REPORT(DMR)

VA0003867		002	
PERMIT NUMBER		DISCHARGE NUMBER	
MONITORING PERIOD			
YEAR	MO	DAY	TO

FROM

TO

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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
068 TKN (N-KJEL)	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
080 TEMPERATURE, WATER (DEG. C)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	C		2D/W	IS
140 ENTEROCOCCI	REPORTD	*****	*****		*****		*****				
	REQRMNT	*****	*****		*****	35	*****	N/CML		1/W	GRAB
379 TOXICITY, FINAL, ACUTE	REPORTD	*****	*****		*****	*****					
	REQRMNT	*****	*****		*****	*****	14	TU-A		1/3M	24HC
389 NITRITE+NITRATE-N, TOTAL	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
500 OIL & GREASE	REPORTD				*****	*****	*****				
	REQRMNT	25	46	KG/D	*****	*****	*****			2/M	GRAB
791 NITROGEN, TOTAL (AS N) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/MO	*****	*****	*****			1/M	CALC
792 NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/YR	CALC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE				
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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/MO	*****	*****	*****				
794 PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****			1/YR	CALC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
795 ORTHOPHOSPHATE (AS P)	REPORTD		*****		*****		*****	MG/L		1/W	24HC
	REQRMNT	NL	*****	KG/D	*****	NL	*****				
805 NITROGEN, TOTAL (AS N) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
806 PHOSPHORUS, TOTAL (AS P) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****			1/M	CALC
	REQRMNT	*****	NL	KG/YR	*****	*****	*****				
	REPORTD									*****	
	REQRMNT										
	REPORTD									*****	
	REQRMNT										
	REPORTD									*****	
	REQRMNT										

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE		DATE					
				TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	YEAR	MO. DAY			
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COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867			003			
PERMIT NUMBER			DISCHARGE NUMBER			
MONITORING PERIOD						
YEAR	MO	DAY	TO	YEAR	MO	DAY

Industrial Major 10/19/2005

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
001 FLOW	REPORTD				*****	*****	*****				
	REQRMNT	NL	NL	MGD	*****	*****	*****				
002 PH	REPORTD	*****	*****			*****				CONT	EST
	REQRMNT	*****	*****		6.0	*****	9.0	SU			
003 BOD5	REPORTD				*****	*****	*****			2/M	GRAB
	REQRMNT	4300	7700	KG/D	*****	*****	*****				
004 TSS	REPORTD				*****	*****	*****			2/M	24HC
	REQRMNT	110	280	KG/D	*****	*****	*****				
007 DO	REPORTD	*****	*****				*****			2/M	24HC
	REQRMNT	*****	*****		NL	NL	*****	MG/L			
012 PHOSPHORUS, TOTAL (AS P)	REPORTD		*****		*****		*****			1/DAY	GRAB
	REQRMNT	3.0	*****	KG/D	*****	2.0	*****	MG/L			
013 NITROGEN, TOTAL (AS N)	REPORTD		*****		*****		*****			1/W	24HC
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L			
039 AMMONIA, AS N	REPORTD	*****	*****		*****					1/W	CALC
	REQRMNT	*****	*****		*****	37	45	MG/L		2/M	24HC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE							
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COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867	003				
PERMIT NUMBER	DISCHARGE NUMBER				
MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY

FROM

TO

INDUSTRIAL MAJOR

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

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		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
068 TKN (N-KJEL)	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
080 TEMPERATURE, WATER (DEG. C)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	C		1/DAY	IS
389 NITRITE+NITRATE- N,TOTAL	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
442 COPPER, DISSOLVED (UG/L AS CU)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	UG/L		1/M	GRAB
500 OIL & GREASE	REPORTD				*****	*****	*****				
	REQRMNT	430	780	KG/D	*****	*****	*****			2/M	GRAB
791 NITROGEN, TOTAL (AS N) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/MO	*****	*****	*****			1/M	CALC
792 NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/YR	CALC
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/MO	*****	*****	*****			1/M	CALC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE			
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				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE				
				TYPED OR PRINTED NAME		SIGNATURE				
							YEAR	MO.	DAY	

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MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY

FROM

TO

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BEFORE COMPLETING THIS FORM.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
794 PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/YR	CALC
795 ORTHOPHOSPHATE (AS P)	REPORTD		*****		*****		*****				
	REQRMNT	NL	*****	KG/D	*****	NL	*****	MG/L		1/W	24HC
805 NITROGEN, TOTAL (AS N) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/M	CALC
806 PHOSPHORUS, TOTAL (AS P) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/M	CALC
	REPORTD										
	REQRMNT									*****	
	REPORTD										
	REQRMNT									*****	
	REPORTD										
	REQRMNT									*****	
	REPORTD										
	REQRMNT									*****	

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE			
<p>I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.)</p>				TYPED OR PRINTED NAME		SIGNATURE	CERTIFICATE NO.	YEAR	MO.	DAY
				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE				
				TYPED OR PRINTED NAME		SIGNATURE		YEAR	MO.	DAY

PERMITTEE NAME/ADDRESS(INCLUDE
FACILITY NAME/LOCATION IF DIFFERENT)

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville VA 22539
FACILITY LOCATION 610 Menhaden Rd

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867			995			
PERMIT NUMBER			DISCHARGE NUMBER			
MONITORING PERIOD						
YEAR	MO	DAY	TO	YEAR	MO	DAY

Industrial Major 10/18/2005

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS
BEFORE COMPLETING THIS FORM.

FROM

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
001 FLOW	REPORTD				*****	*****	*****				
	REQRMNT	NL	NL	MG/L	*****	*****	*****			CONT	EST
002 PH	REPORTD	*****	*****			*****					
	REQRMNT	*****	*****		6.0	*****	9.0	SU		5D/W	GRAB
019 COPPER, TOTAL (AS CU)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	UG/L		1/M	24HC
080 TEMPERATURE, WATER (DEG. C)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	45	C		1/DAY	IS
186 SILVER, TOTAL RECOVERABLE	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	UG/L		1/M	24HC
448 ZINC, DISSOLVED (AS ZN) (UG/L)	REPORTD	*****	*****		*****						
	REQRMNT	*****	*****		*****	NL	NL	UG/L		1/M	GRAB
	REPORTD										
	REQRMNT									*****	
	REPORTD										
	REQRMNT									*****	

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE					
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				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT						TELEPHONE		
				TYPED OR PRINTED NAME		SIGNATURE			YEAR	MO.	DAY	

PERMITTEE NAME/ADDRESS(INCLUDE
FACILITY NAME/LOCATION IF DIFFERENT)

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville VA 22539
FACILITY LOCATION 610 Menhaden Rd

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM(NPDES)
DISCHARGE MONITORING REPORT(DMR)

VA0003867			996		
PERMIT NUMBER			DISCHARGE NUMBER		
MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY

FROM

TO

Industrial Major 11/16/2005

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

Piedmont Regional Office
4949-A Cox Road

Glen Allen VA 23060

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS
BEFORE COMPLETING THIS FORM.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
791 NITROGEN, TOTAL (AS N) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/MO	*****	*****	*****			1/M	CALC
792 NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	REPORTD				*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/YR	CALC
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/MO	*****	*****	*****			1/M	CALC
794 PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	REPORTD				*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/YR	CALC
805 NITROGEN, TOTAL (AS N) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/M	CALC
806 PHOSPHORUS, TOTAL (AS P) (YEAR-TO-DATE)	REPORTD	*****			*****	*****	*****				
	REQRMNT	*****	NL	KG/YR	*****	*****	*****			1/M	CALC
	REPORTD										
	REQRMNT									*****	
	REPORTD										
	REQRMNT									*****	

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW(M.G.)	TOTAL BOD5(K.G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE						
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				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT						TELEPHONE			
				TYPED OR PRINTED NAME		SIGNATURE				YEAR	MO.	DAY	

THIS REPORT IS REQUIRED BY LAW (33 U. S. C. § 1318 40 CFR 122.60). FAILURE TO REPORT OR FAILURE TO REPORT TRUTHFULLY WILL RESULT IN CIVIL PENALTIES NOT TO EXCEED \$10,000 PER DAY OF VIOLATION; OR IN CRIMINAL PENALTIES NOT TO EXCEED \$25,000 PER DAY OF VIOLATION OR BY IMPRISONMENT FOR NOT MORE THAN FIVE YEARS, OR BOTH.

GENERAL INSTRUCTIONS

1. Complete this form in permanent ink or indelible pencil.
2. Be sure to enter the dates for the first and last day of the period covered by the report on the form in the space marked "Monitoring Period".
3. For those parameters where the "permit requirement" spaces are blank or a limitation appears, provide data in the "reported" spaces in accordance with your permit.
4. Enter the average and, if appropriate, maximum quantities and units in the "reported" spaces in the columns marked "Quantity or Loading".
 $\text{KG/DAY} = \text{Concentration(mg/l)} \times \text{Flow(MGD)} \times 3.785$.
5. Enter maximum, minimum, and/or average concentrations and units in the "reported" spaces in the columns marked "Quality or Concentration".
6. Enter the number of samples which do not comply with the maximum and /or minimum permit requirements in the "reported" space in the column marked "No. Ex.".
7. Enter the actual frequency of analysis for each parameter (number of times per day, week, month) in the "reported" space in the column marked "Frequency of Analysis".
8. Enter the actual type of sample collected for each parameter in the "reported" space in the column marked "Sample Type".
9. Enter additional required data or comments in the space marked "additional permit requirements or comments".
10. Record the number of bypasses during the month, the total flow in million gallons and BOD5 in kilograms in the proper columns in the section marked "Bypasses and Overflows".
11. The operator in responsible charge of the facility should review the form and sign in the space provided. If the plant is required to have a licensed operator, the operator's certificate number should be reported in the space provided.
12. The principal executive officer should then review the form and sign in the space provided and provide a telephone number where he/she can be reached.
13. You are required to sample at the frequency and type indicated in your permit.
14. Send the completed form to your Dept. of Environmental Quality Regional Office by the 10th of each month.
15. You are required to retain a copy of the report for your records.
16. Where violations of permit requirements are reported, attach a brief explanation in accordance with the permit requirements describing causes and corrective actions taken. Reference each violation by date.
17. If you have any questions, contact the Dept. of Environmental Quality Regional Office.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

1. Compliance Reporting

a. The quantification levels (QL) for water samples shall be as follows:

<u>Effluent Characteristic</u>	<u>Quantification Level</u>
BOD ₅	5 mg/l
TSS	1.0 mg/l
Chlorine/CPO	0.10 mg/l
Ammonia-N	0.2 mg/l
Total Phosphorus	0.1 mg/l
Orthophosphate	0.1 mg/l
Total Kjeldhal Nitrogen	0.5 mg/l
Nitrate-Nitrite Nitrogen	0.5 mg/l
Total Recoverable Copper and Dissolved Copper	7.4 ug/l
Total Recoverable Silver	1.6 ug/l
Dissolved Zinc	72 ug/l

b. Reporting

- (1) Monthly Average Limit--Compliance with the monthly average limitations and/or reporting requirements for the parameters listed above shall be determined as follows: All concentration data below the test method QL shall be treated as zero. All concentration data equal to or above the QL listed above shall be used to calculate the reported average. An arithmetic average shall be calculated using all reported data, including the defined zeros, for the month. This arithmetic average shall be reported on the Discharge Monitoring Report (DMR) as calculated. If all data are below the QL, then the average shall be reported as "<QL." If reporting for quantity is required on the DMR and the calculated concentration is <QL then report "<QL" for the quantity otherwise use the calculated concentration.
- (2) Daily Maximum Limit--Compliance with the daily maximum limitations and/or reporting requirements for the parameters listed above shall be determined as follows: All concentration data below the test method QL shall be treated as zero. All concentration data equal to or above the QL shall be treated as reported. An arithmetic average of the values shall be calculated using all reported data, including the defined zeroes, collected for each day during the reporting month. The maximum value of these daily averages thus determined shall be reported on the DMR as the Daily Maximum. If all data are below the QL then the average shall be reported as "<QL." If reporting for quantity is required on the DMR and the calculated concentration is <QL then report "<QL" for the quantity otherwise use the calculated concentration.
- (3) Any single datum required shall be reported as "<QL" if it is less than the QL listed in 1.above. Otherwise the numerical value shall be reported.
- (4) Monitoring results reported on the DMR shall be reported to the accuracy of the test, which must be capable of reporting at least the same number of significant digits as the permit limit for a given parameter. Rounding the results to the number of significant digits in the permit, where the test method is sensitive enough to report more, is not acceptable and shall not be allowed. If there is not a method allowed by the permit that is accurate enough to measure two significant digits below the value of 1.0, it will be the permittee's responsibility to provide documentation for DEQ approval demonstrating that only one significant figure can accurately

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

be reported.

2. The discharge from Out fall 003 will be transported to the Chesapeake Bay and shall meet the following requirements:

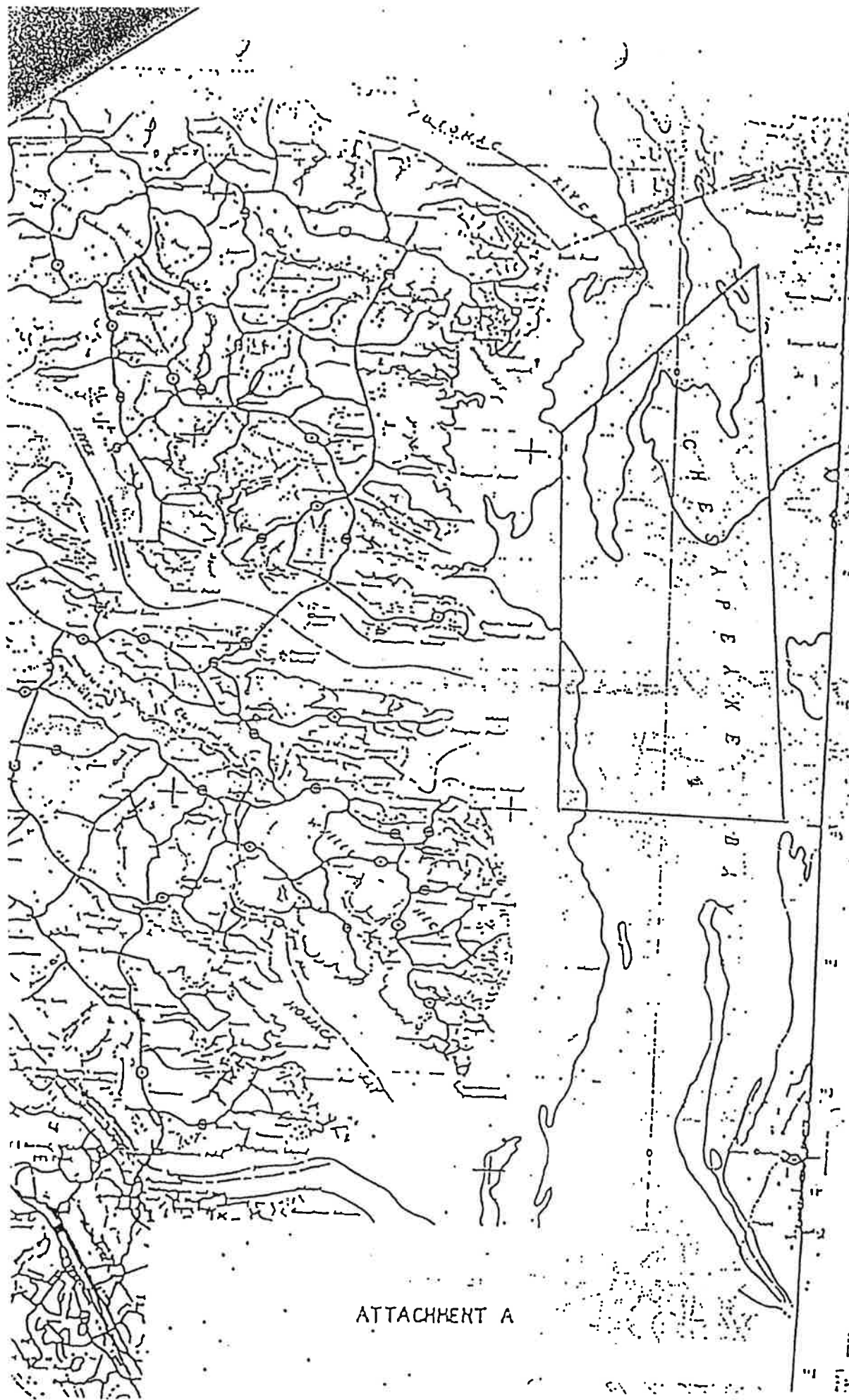
- a. pH limitation for this outfall shall be met through analysis of samples taken at barge effluent in accordance with "e" described below.
- b. The discharge into the Chesapeake Bay will be allowed only into a quadrant specified by the following four points, designated by latitude 37° 30' 0", longitude 76° 12' 40"; latitude 37° 45' 55", longitude 76° 13' 15"; latitude 37° 53' 12", longitude 76° 4' 20"; latitude 37° 30' 0", longitude 76° 2' 35"; as shown on Attachment A.
- c. A Bay discharge vessel log must be maintained and made available to the Department of Environmental Quality for inspection upon request by the staff.
- d. Duration of the discharge shall be less than or equal to 3 hours per day.
- e. While discharging in the designated area, the barge discharge shall be accomplished according to the following restrictions:

Pump Rate	Barge Speed
1000 gpm	>2 knots
1500 gpm	>3 knots
2000 gpm	>4 knots.

The pump rate and barge speed shall be recorded in the discharge vessel log for each discharge.

- f. Monitoring of the designated area of the Chesapeake Bay (B.2.b.) for BOD₅, Ammonia, pH, Temperature, Dissolved Oxygen and Salinity, is required before and after each discharge, and the samples shall be grabbed at a depth of between six to eight feet below the surface of the water inside the visible discharge plume. These data shall be submitted with the DMR for that month to be received at the DEQ-Piedmont Regional Office by the tenth of the following month.
3. The discharge of refrigeration water will be transported to the Chesapeake Bay and shall meet the following requirements:
- a. The pH of the effluent shall be between 6 and 9 S.U.
 - b. The discharge from the permittee's vessels into the Chesapeake Bay will be allowed only east of a line between Fleeton Point Light and Black Can Buoy # 3. Such discharge shall be made while the vessel is underway and at such a rate that the visibilities of the discharge plume is minimized.
 - c. A Bay discharge vessel log must be maintained and made available to the Department of Environmental Quality for inspection upon request by the staff.
 - d. Monitoring of the designated area of the Chesapeake Bay (B.2.b.) for BOD₅, Ammonia, pH, Temperature, Dissolved Oxygen and Salinity, is required twice a month before and after the discharge, and the samples shall be grabbed at a depth of between six to eight feet below the surface of the water inside the visible discharge plume. These data shall be submitted with the

ATTACHMENT A



ATTACHMENT A

Map of the Chesapeake Bay Region

Scale: 1 inch = 10 miles

Legend:

Symbol	Description
[Symbol]	Major cities
[Symbol]	Minor cities
[Symbol]	Water bodies
[Symbol]	Land areas
[Symbol]	Transportation routes

Map of the Chesapeake Bay Region

Scale: 1 inch = 10 miles

Legend:

Symbol	Description
[Symbol]	Major cities
[Symbol]	Minor cities
[Symbol]	Water bodies
[Symbol]	Land areas
[Symbol]	Transportation routes

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

DMR for that month to be received at the DEQ-Piedmont Regional Office by the tenth of the following month. Any discharge of refrigeration water to State waters must result in compliance with Water Quality Standards.

4. The permittee shall submit a plan for monitoring of Cockrell's Creek which shall include the following components, at a minimum:
 - a. Sampling/monitoring station locations, including a map with the locations noted.
 - b. The permittee shall sample monthly for the parameters of ammonia-nitrogen, temperature, pH, and salinity in accordance with procedures approved under Title 40 Code of Federal Regulations Part 136 or alternative methods approved by the U.S. Environmental Protection Agency. Please refer to B.1. above for quantification levels. At the time of sampling, the permittee shall ensure that the effects of tidal influences are kept to an absolute minimum by sampling at low slack water tide.
 - c. Sampling shall begin within 30 days of the reissuance of this permit and each subsequent year with the start of fishing for that particular year. Sample results shall be submitted to the Piedmont Regional Office of the DEQ by the 10th day of the following month.
 - d. If the results of this monitoring indicate actual or potential water quality standard violations, the permit may be modified, or, alternatively, revoked and reissued, in order to incorporate more stringent permit requirements.

**5. BACTERIAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS –
ADDITIONAL INSTRUCTIONS**

- a. Enterococci sampling and analysis shall be performed in accordance with one of the following methods:
 - 1). EPA Method 1600: Membrane Filtration Method for Enterococci in Water
 - 2). Standard Methods (18th, 19th, 20th editions) Method 9230B: Multiple Tube Technique for Fecal Streptococcus and Enterococcus Groups
 - 3). Standard Methods (18th, 19th, 20th editions) Method 9230C: Membrane Filter Techniques for Fecal Streptococcus and Enterococcus Groups
 - 4). ASTM Method D6503 (ASTM Volume 11.02): Standard Test Method of Enterococci in Water Using EnterolefTM
6. The permittee shall notify the Department as soon as they know or have reason to believe:
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2, 4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application; or
 - (4) The level established by the Board.
 - b. That any activity has occurred or will occur which would result in any discharge on a non-routine or infrequent basis of a toxic pollutant which is not limited in the permit if that discharge will exceed the highest of the following "notification levels":

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

- (1) Five hundred micrograms per liter (500 ug/l);
- (2) One milligram per liter (1 mg/l) for antimony;
- (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or
- (4) The level established by the Board.

7. Any and all product, materials, industrial wastes, and/or other wastes resulting from the purchase, sale, mining, extraction, transport, preparation and/or storage of raw or intermediate materials, final product, by-product or wastes, shall be handled, disposed of, and/or stored in such a manner so as not to permit a discharge of such a product, materials, industrial wastes, and/or other wastes to State waters, except as expressly authorized.

8. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

9. Operations and Maintenance Manual

The permittee shall review the existing Operations and Maintenance (O&M) Manual and notify the DEQ Piedmont Regional Office in writing whether it is still accurate and complete within 90 days of the effective date of this permit. If the O&M manual is no longer accurate and complete, a revised O&M Manual shall be submitted for approval to the DEQ Piedmont Regional Office within 90 days of the effective date of this permit. **The permittee shall maintain an accurate, approved operation and maintenance manual for the treatment works. This manual shall detail the practices and procedures, which will be followed to ensure compliance with the requirements of this permit. The permittee shall operate the treatment works in accordance with the approved O&M manual.** This manual shall include, but not necessarily be limited to, the following items, as appropriate:

- a. Techniques to be employed in the collection, preservation and analysis of effluent samples;
- b. Discussion of Best Management Practices, to include those instituted at the new fishmeal barge operation;
- c. Procedures for handling, storing, and disposing of all wastes, fluids, and pollutants characterized in Part I.B.7 that will prevent these materials from reaching state waters.
- d. Treatment works design, treatment works operation, routine preventive maintenance of units within the treatment system, critical spare parts inventory and record keeping;
- e. A plan for the management and/or disposal of waste solids and residues; and
- f. Procedures for measuring and recording the duration and volume of treated wastewater discharged.

Any changes in the practices and procedures followed by the permittee shall be documented and submitted to the Department of Environmental Quality, Piedmont Office, for staff approval within 90 days of the effective date of the changes. Upon approval of the submitted manual changes, the revised manual becomes an enforceable part of the permit. Noncompliance with the O&M Manual shall be deemed a violation of the permit.

10. The permittee shall employ or contract at least one Class III licensed wastewater works operator for the facility. The license shall be issued in accordance with Title 54.1 of the Code of Virginia and the regulations of the Board for Waterworks and Wastewater Works Operators. The permittee shall notify the Department in writing whenever he is not complying, nor has grounds for

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

anticipating he will not comply with this requirement. The notification shall include a statement of reasons and a prompt schedule for achieving compliance.

11. The permittee shall complete and submit Item V and VI of Form 2C, for Outfall 003, no later than 30 days after the effective date of the permit or within 30 days of the first discharge of the season of evaporation condensate to the lagoon if the timeframe within 30 days of the effective date of the permit falls within a period when Omega is not operating. Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.
12. The permittee shall submit to the DEQ Piedmont Regional Office a lagoon salinity profile within 90 days of the reissuance of this permit. Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.
13. The permittee shall submit a plan and schedule for the use of chlorine in the cyanide removal process by November 26, 2006 if necessary. The chlorine limit at 001 shall become effective in accordance with the approved plan and schedule.
14. Best Management Practices (BMP)
 - a. The permittee shall comply with the following at the Off Season Maintenance area shown in Attachment B:
 1. Best Management Practices (BMP)
 - a) The permittee shall comply with the following:
 - (1) For vessels in which sanitary waste tanks (holding tanks) are installed, all sewage from the vessels shall be removed and disposed of by a commercial waste disposal company or discharged into the shipyard's sanitary waste system.
 - (2) For vessels without sanitary waste holding tanks installed, the vessel's sanitary systems shall not be permitted to discharge sewage overboard into the adjacent river. Vessels without holding tanks shall be connected to a holding tank or shoreside system in compliance with Virginia Department of Health Regulations.
 - (3) The yard shall be cleaned on a regular basis to minimize the possibility that runoff will carry spent abrasives, paints, solvents, cleaners, anti-corrosive compounds, paint chips, scrap metal, trash, garbage, petroleum products or other debris into the receiving stream. Cleanup of areas contributing runoff shall consist of mechanical or manual methods to sweep up and collect the debris.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

Mechanical cleanup may be accomplished by mechanical sweepers, front-end loaders, vacuum cleaners or other innovative equipment. Manual methods include the use of shovels and brooms.

- (4) Docks shall also be cleaned on a regular basis so as to prevent rain from washing material into receiving waters.
- (5) Acceptable methods of control shall be utilized during abrasive blasting and spray painting, with the intent of preventing blast dust and over spray from falling into the receiving water. These include the following: down spraying of blast materials and paint; barriers or shrouds beneath the hull; barriers or shrouds between the hull and temporary/permanent support structures, from the flying bridge to temporary/permanent support structures, or from the bow and stern of the vessel to temporary structures erected for that purpose. The bottom edge of free hanging barriers shall be weighted to hold them in place during a light breeze. When abrasive blasting vessel superstructures, openings and open areas between decks shall be covered (including but not limited to scuppers, railings, freeing ports, ladders, and doorways) if they allow discharge to State waters.
- (6) Fixed or floating platforms shall be used as work surfaces when working at the water surface. These platforms shall be used to provide a surface to catch spent abrasive, slag, paint, trash and other debris/pollutants and shall be cleaned at the end of each work shift.
- (7) Dust and over spray from abrasive blasting and painting in yard facilities shall be controlled to minimize the spreading of wind blown materials. Frequent cleanup of these areas shall be practiced to prevent abrasive blasting waste from being washed into storm sewers or the adjacent waterway.
- (8) When water blasting, hydroblasting, or water-cone blasting is used to remove paint from surfaces, the resulting water and debris shall be collected in a sump or other suitable device. This mixture then will be either delivered to appropriate containers for removal and disposal or subjected to treatment to concentrate the solids for proper disposal and prepare the water for reuse or discharge through an authorized outfall.
- (9) All shipboard cooling water and process water shall be directed away from contact with spent abrasive, paint and other debris. Contact of spent abrasive and paint with water will be prevented by proper segregation and control of wastewater streams.
- (10) Cleaning procedures shall be employed to remove waste materials in order to prevent their introduction into the storm drainage system.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

- (11) The sediment traps in the stormwater drainage system(s) for areas around marine railways, docks and other industrial areas shall be inspected on a monthly basis and cleaned as necessary to ensure the interception and retention of solids entering the drainage system. Inspection logs and cleaning records must be maintained.
- (12) During the period at the dock, oil, grease or fuel spills shall be prevented from reaching State waters. Cleanup shall be carried out promptly after oil, grease or fuel spill is detected. Oil containment booms shall be conveniently stored so as to be immediately deployable in the event of a spill.
- (13) Drip pans or other protective devices shall be required for all oil or oily waste transfer operations to catch incidental spillage and drips from hose nozzles, hose racks, drums or barrels.
- (14) Oil contaminated materials shall be removed from the marine repair area as soon as possible.
- (15) If required, a SPCC Plan and an oil spill discharge contingency plan must be on file, maintained current and utilized in the event that an oil spill occurs. If a spill is discovered, designated shipyard personnel should be notified immediately. Such personnel must be familiar with containment and cleanup procedures, and must notify the Coast Guard and the DEQ of all spills that reach State waters, and immediately initiate containment/cleanup efforts. These cleanup procedures apply to hazardous substances kept on site as well. A list of such materials shall be provided to the DEQ for reference if a spill occurs. Included with this list must be an appropriate designated disposal site for each substance. Emulsifiers and dispersants are not suitable cleanup agents for spills in State waters.
- (16) Solid chemicals, chemical solutions, paints, oils, solvents, acids, caustic solutions and waste materials, including used batteries, shall be stored in a manner which will prevent the entry of these materials into waters of the State, including ground waters. Storage shall be in a manner that will prevent entry into State waters by overfilling, tipping, rupture, or other accidents within the storage area.
- (17) All metal finishing chemical solution, caustic wash, and rinse-water tanks shall be stored in such a manner so as to prevent introduction of spills into State waters. Any intercepted chemical spill shall be recycled back to the appropriate chemical solution tank or disposed of. The spilled material must be handled, recycled or disposed of in such a manner as to prevent its discharge into State waters.
- (18) The mixing of paints and solvents shall be carried out in locations and under conditions such that no spill shall enter State waters

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

- (19) Drip pans or other protective devices shall be required for all paint mixing and solvent transfer operations, unless the mixing operation is carried out in controlled areas away from storm drains, surface waters, shorelines and piers. Drip pans, drop cloths or tarpaulins shall be used whenever paints and solvents are mixed. Sorbents must be on hand to soak up liquid spills. Paints and solvents shall not be mixed in areas where spillage would have direct access to State waters unless containment measures are employed.
- (20) Paint and solvent spills shall be treated as oil spills and shall be prevented from reaching storm drains or deck drains and subsequent discharge into the water.
- (21) The amount of paint stored within the marine repair area shall be kept to a minimum.
- (22) Trash receptacles shall be provided on each pier and onboard each vessel. These receptacles shall be emptied as necessary to prevent trash from entering State waters.
- (23) Leaking connections, valves, pipes, hoses and soil chutes carrying wastewater shall be replaced or repaired immediately. Soil chute and hose connections to vessels and to receiving lines or containers shall be tightly connected and leak free.
- (24) Prior to hose testing, spent abrasives, paint residues, and other debris from the area of the marine repair area shall be removed to prevent pollutants from entering the adjacent river.
- (25) Floatable and low-density waste such as wood and plastic, as well as miscellaneous trash such as paper, insulation, and packaging, etc., shall be removed from the marine repair area.
- (26) Uncontaminated bilge and ballast or oil contaminated bilge and ballast treated by an onboard oil/water separator may be discharged to State waters. Any other contaminated bilge and ballast shall not be discharged except as limited by Part I Effluent Limitations.
- (27) All vessels that are hauled shall be beyond the normal high tidal zone. In the event of vessel overhang during abnormally high tides, all exterior abrasive/water blasting and coating work on the overhanging portion of the vessel shall be discontinued. Exterior work on vessels will not be in areas that extend beyond the length of the marine repair area, unless appropriate precautions are taken to prevent discharge of pollutants into State waters.
- (28) Docking and launching time intervals shall not be considered as a

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

rationale for not cleaning the marine repair area.

- (29) Innovative measures for collecting abrasives may be presented for evaluation.
- (30) Material (spent abrasives, paint chips, etc.) shall be cleaned up from the area in the vicinity of the marine repair area before the incoming tide.
- (31) Vessels which have been fitted to collect gray water, either with sewage or separately, shall not discharge the gray water into surface waters unless specifically addressed as a permitted discharge in Part I A.

b.) Reporting

The permittee shall **submit, with the DMRs, a monthly report** certifying compliance or noncompliance with all conditions of the preceding BMPs pertaining to marine repair areas, piers, wet slips and shore side work areas. The reporting form is provided as Attachment C to this permit. The report, as submitted on Attachment C, shall include a weekly audit checklist for these areas and a narrative description of observations. The audit shall be conducted by personnel not routinely associated with the aforementioned activities.

15. Within 90 days of the effective date of this permit, the permittee shall submit to the DEQ Piedmont Regional Office an approvable plan for monitoring and analyzing the ambient quality of the water column at both boat maintenance area locations (Attachment B.1. and B.2.) during periods of boat maintenance activity. The plan shall be approved by DEQ prior to performing any boat maintenance activities in, or directly over, surface waters. Once approved, the plan shall become an enforceable provision of this permit. At a minimum, the plan shall include: sample station locations; sample depth; sample frequency; sample type; sample preservation; chain of custody; sampling and analytical methods; and analytical detection and quantification levels.

Each month that boat maintenance activities occur in, or directly over, surface waters, the permittee shall provide notification to DEQ-PRO of such activities with the Discharge Monitoring Report submitted for that month. Water samples shall be collected at slack tide during each period of boat maintenance activities. Analytical results shall be submitted to the DEQ – PRO within 60 days following sample collection. The samples shall be tested for Total Petroleum Hydrocarbons, Dissolved Copper, Dissolved Zinc, Dissolved Lead and Tributyltin (TBT). A map shall be included showing the location of the samples taken, and must show that the samples were obtained during times of boat maintenance activity from the area of the docks where the boats are maintained.

Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

16. Compliance Schedules

The permittee shall achieve compliance with the final limits and monitoring requirements for Total Phosphorus at 002 and 003 as specified in this permit in accordance with the following schedule:

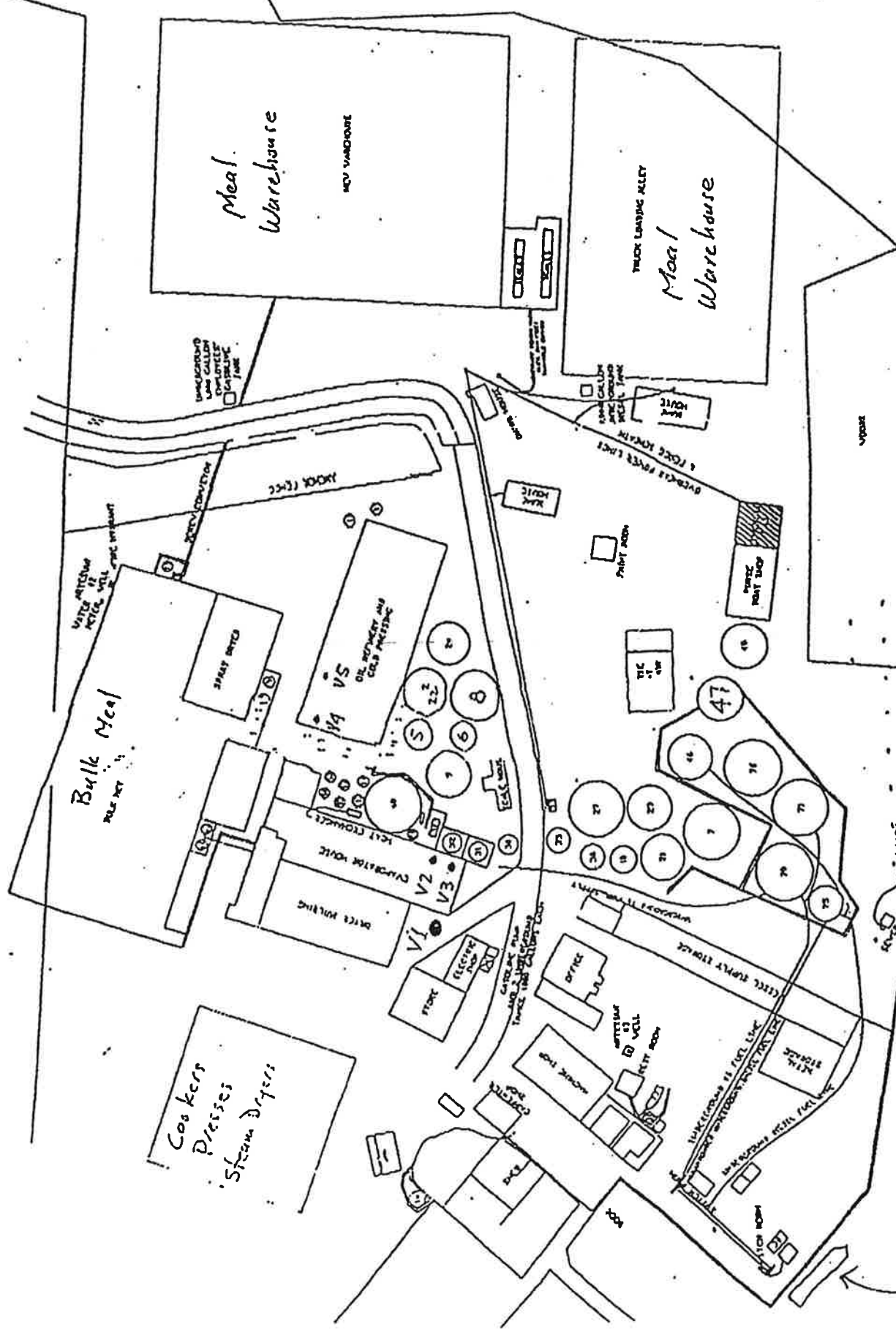
1. Initiate plans for compliance	Within 90 days after the effective date of permit reissuance.
2. Report of progress to DEQ	Quarterly. (Total Phosphorus shall be monitored at 003 during interim).
3. Achieve Compliance with Effluent Limitations.	Within 3 years of the effective date of permit reissuance.

The permittee shall achieve compliance with the final limits for Fecal coliform, enterococci at 002, Total Recoverable Copper and Total Recoverable Silver at outfall 995 (004/005) and Annual Nutrient Loadings at 996 as specified in this permit in accordance with the following schedule:

1. Select a design engineer	Within 18 months after the effective date of permit reissuance.
2. Submit final, approvable plans and specifications to DEQ.	Within 24 months of the permit effective date
3. Submit progress reports	By January 10 th of each year
4. Comply with Effluent Limitations.	Within 48 months of the permit effective date.

Within 14 days of the due date for items 1, 2, and 4 above, the permittee shall submit a report to the DEQ Piedmont Regional Office indicating whether the requirement was met.

TANK NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100



Scale 0 100 Ft Approx.

FIGURE 1: SITF PI AN

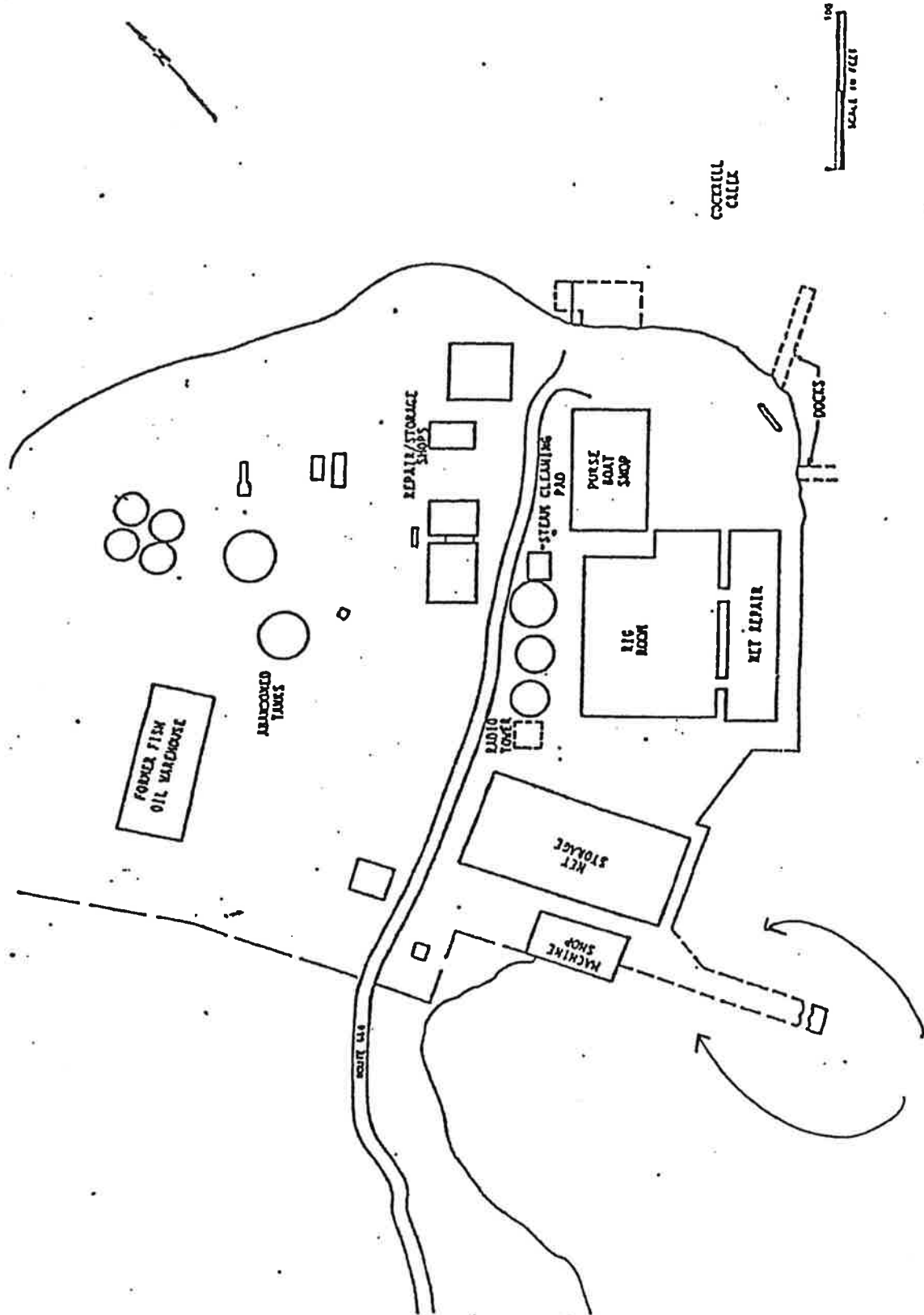
Location of ship during off-season maintenance.

WB

Fairport-Boatyard

Omega Protein, Inc.
Reedville, VA February 2

Ship Repair (BMPs)



ATTACHMENT C
DEPARTMENT OF ENVIRONMENTAL QUALITY
BMP Compliance Report

Facility Name: Omega Protein
Address: Reedville, VA.

VPDES Permit No.: VA0003867

Report Period: From / / To / /

Paint Area

COMPLIANCE / NONCOMPLIANCE *
(check as appropriate)

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

*Comments on Noncompliance

Name of Principal Exec. Officer or Authorized Agent / Title

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. paragraph 1001 and 33 U.S.C. paragraph 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years).

Signature of Principal Officer or Authorized Agent / Date

17. Oil Storage Ground Water Monitoring Reopener. As this facility currently manages ground water in accordance with 9 VAC 25-91-10 et seq., Facility and Aboveground Storage Tank (AST) Regulation, this permit does not presently impose ground water monitoring requirements. However, this permit may be modified or alternatively revoked and reissued to include ground water monitoring not required by the AST regulation.
18. This permit shall be modified or alternatively revoked and reissued if any approved wasteload allocation procedure, pursuant to Section 303(d) of the Clean Water Act, imposes wasteload allocations, limits or conditions on the facility that are not consistent with the permit requirements.
19. This permit may be modified or, alternatively, revoked and reissued to incorporate new or alternative nutrient limitations and/or monitoring requirements should the State Water Control Board adopt new nutrient standards for the waterbody receiving the discharge, including the Chesapeake Bay or its tributaries, or if a future water quality regulation or statute requires new or alternative nutrient control.
20. Upon the permittee obtaining coverage under a watershed general permit issued for the control of Total Nitrogen and Total Phosphorus loadings to the Chesapeake Bay or its tidal tributaries, the Total Nitrogen and Total Phosphorus annual load limitations and any associated monitoring requirements and schedule(s) of compliance contained herein shall be waived in lieu of those in the general permit. Upon the effective date of the permittee's watershed general permit Total Phosphorus limitation, the monthly average Total Phosphorus limitations contained herein are also waived.
21. For each calendar month, the DMR shall show the total monthly load (kg) and the cumulative load for the calendar year to date (kg) calculated in accordance with the following formulae.

$$ML = ML_{ave} * d$$

where:

ML = total monthly load in kg (Parameter Codes 791 and 793)
ML_{ave} = monthly average load as reported on DMR (kg/d)
d = number of discharge days in the calendar month

$$AL - YTD = \sum_{(Jan-current\ month)} ML$$

where:

AL - YTD = calendar year-to-date annual load in kg (Parameter Codes 805 and 806)

$$AL = \sum_{(Jan-Dec)} ML$$

Where: AL = Calendar year annual load in kg/yr (Parameter Codes 792 and 794)

22. Basis of Design Report for Nutrient Removal

Within one year of the effective date of this permit, a Basis of Design Report addressing the construction and operation of a range of nutrient removal technologies up to and including the limit of technology, shall be submitted to the Department of Environmental Quality. Additional information on the scope and contents of a Basis of Design Report is available from DEQ staff. A more comprehensive Conceptual Engineering Report may be submitted to fulfill this requirement.

23. Interim Optimization Plan for Nutrient Removal
Within one year of the effective date of this permit, a report addressing operating alternatives and interim measures that may be taken to optimize nutrient removal with the existing facilities shall be submitted to the Department of Environmental Quality. The report shall describe alternatives considered and a plan to implement the selected interim measures.
24. The permittee shall monitor the effluent at outfall 001, 002, 003 and 995 for the substances noted in Attachment D of the permit according to the indicated analysis number, quantification level, sample type and frequency. Using Attachment A as the reporting form, the data shall be submitted within 1 year of the effective date of the permit. In the case of 003, the evaporation condensate to the lagoon shall be sampled if the barge outfall has not been used. Monitoring and analysis shall be conducted in accordance with 40 CFR Part 136 or alternative EPA approved methods. It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sample gathering and analytical procedures. Should effluent monitoring indicate the need for any water quality-based limitations for these or any other parameters, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.
25. Within 60 days after the effective date of this permit, the permittee shall submit to the PRO for approval:
- a protocol for establishing a valid water balance for the treatment lagoon, or
 - a protocol for monitoring groundwater quality impacts due to lagoon leakage, or
 - documentation that the treatment lagoon's permeability is not greater than 10^{-6} cm/sec.

If the water balance option is selected, then the following requirements shall apply:

- Within 60 days after the approval of the protocol, the permittee, utilizing the approved protocol, shall submit a valid monthly water balance for this facility. Thereafter, the permittee shall submit a valid water balance monthly for 12 consecutive months, due by the tenth of each month for the previous month's performance.
- Should any monthly water balance indicate lagoon liner permeability in excess of 10^{-6} cm/sec, the permittee, upon written notice by the Regional Director, shall within 60 days of such notification submit for approval a plan and schedule for corrective action. If the corrective action plan specifies installation of a liner, the liner must exhibit a coefficient of permeability of no more than 10^{-6} cm/sec.

If the groundwater monitoring program option is selected, then the following requirements shall apply:

- Within 60 days after the approval of the protocol, the permittee, utilizing the approved protocol, shall submit valid groundwater monitoring data. Thereafter, the permittee shall submit groundwater monitoring data in accordance with the protocol schedule.
- Should this groundwater monitoring data indicate contamination to groundwater, the permittee, upon written notification by the Regional

Director, shall within 60 days of such notification submit for approval a plan and schedule for corrective action. If the corrective action plan specifies installation of a liner, the liner must exhibit a coefficient of permeability of no more than 10^{-6} cm/sec.

C. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

1. Toxics Management Program

a. Biological Monitoring (Outfall 001):

- (1) The permittee shall conduct quarterly acute and chronic toxicity tests for a period of one-year using 24-hour flow-proportioned samples of final effluent from outfall 001. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute tests shall be 48-hour static tests using Mysidopsis bahia and Cyprinodon variegatus, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} . The chronic tests shall be static renewal tests using M. bahia and C. variegatus. The M. bahia test shall be a 7-day larval survival, growth and/or fecundity test, and the C. variegatus test shall be a 7-day larval survival and growth test. These chronic tests shall be conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction or growth. The permittee may provide additional samples to address data variability. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.
- (2) The following criteria shall be used in evaluating the toxicity test data generated in I.C.1.a. (1) above:
 - (a) LC_{50} greater than or equal to 7% effluent in six of the total of eight acute toxicity tests, or in at least 75% of the tests conducted, if more than eight tests are conducted.
 - (b) No Observed Effect Concentration (NOEC) greater than or equal to the Instream Waste Concentration (IWC) of 0.9%, in six of the total of eight toxicity tests, or in at least 75% of the tests if more than eight tests are conducted.

Any effluent failing either of the above criteria shall be considered to have demonstrated actual or potential toxicity and a WET limit will be required. In the event the plant is not operating during one of the reporting quarters, the permittee shall submit a statement along with the DMR for the following month, and continue testing as in I. C.1.a. (2) (a) and (b) above until the required number of tests have been completed.

- (3) If, prior to completing the monitoring requirements specified in I. C.1.a. (1) above, it is determined that the effluent fails the decision criteria outlined in I. C.1.a. (2), the effluent shall be considered to have demonstrated actual potential toxicity and a Whole Effluent Toxicity (WET) limit and a compliance period will be required.

- (4) Following successful completion of the testing of outfall 001 as in I. C.1.a. (1) above, the permittee shall resume annual acute and chronic toxicity testing of the outfall. The first annual tests shall be conducted within 30 days of initial annual discharge from the outfall following completion of the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests, or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a WET limit of the outfall has been established.
- (5) If, in the testing according to I.C.1.a. (4) above, any of the annual acute toxicity tests yields an LC_{50} of less than 7% effluent, or any of the annual chronic tests yields an NOEC less than the IWC of 0.9%, the test shall be repeated within three months.
 - (a) If the retest also indicates an LC_{50} of less than 7% effluent or an NOEC less than the IWC, quarterly toxicity testing as in I. C.1.a. (1) above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction and a WET limit.
 - (b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

b. Biological Monitoring (Outfall 003):

- (1) If the permittee elects to discharge process wastewater (evaporator condensate only) via outfall 003, then the following testing will be required for each discharge event until the first four discharge events have occurred:

Two acute toxicity tests using grab samples of final effluent from outfall 003. The acute tests shall be 48-hour static tests using Cyprinodon variegatus and Mysidopsis bahia, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} .
- (2) The following criterion shall be used in evaluating the toxicity test data generated in (1) above:

LC_{50} greater than or equal to 25% effluent concentration in six of the total of eight acute toxicity tests
- (3) If effluent from outfall 003 fails the above criterion it shall be considered to have demonstrated actual or potential toxicity. Accordingly, continued discharge of this effluent via outfall 003 shall be prohibited. In order to resume discharging from this outfall the permittee must:
 - (a) assure the absence of actual or potential toxicity, or
 - (b) demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.

FACILITY NAME: Omega Protein, Inc.
 ADDRESS: P.O. Box 175
 Reedville, VA 22539

Permit No. VA0003867
 Attachment D
 Page 1 of 2

DEPARTMENT OF ENVIRONMENTAL QUALITY
 WATER QUALITY MONITORING

OUTFALL NO.

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
DISSOLVED METALS						
7440-28-0	Thallium	(4)	(5)		G	(3)
PESTICIDES/PCB'S						
959-98-8	Alpha-Endosulfan	608	0.1		G or C	(3)
33213-65-9	Beta-Endosulfan	608	0.1		G or C	(3)
1031-07-8	Endosulfan Sulfate	608	0.1		G or C	(3)
7421-93-4	Endrin Aldehyde	(4)	(5)		G or C	(3)
1024-57-3	Heptachlor Epoxide	(4)	(5)		G or C	(3)
319-84-6	Hexachlorocyclohexane Alpha-BHC	(4)	(5)		G or C	(3)
319-85-7	Hexachlorocyclohexane Beta-BHC	(4)	(5)		G or C	(3)
1336-36-3	PCB Total	608	7.0		G or C	(3)
BASE NEUTRAL EXTRACTABLES						
92-87-5	Benzidine	(4)	(5)		G or C	(3)
111-44-4	Bis 2-Chloroethyl Ether	(4)	(5)		G or C	(3)
39638-32-9	Bis 2-Chloroisopropyl Ether	(4)	(5)		G or C	(3)
91-58-7	2-Chloronaphthalene	(4)	(5)		G or C	(3)
84-74-2	Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	625	10.0		G or C	(3)
91-94-1	3,3-Dichlorobenzidine	(4)	(5)		G or C	(3)
131-11-3	Dimethyl phthalate	(4)	(5)		G or C	(3)
122-66-7	1,2-Diphenylhydrazine	(4)	(5)		G or C	(3)
118-74-1	Hexachlorobenzene	(4)	(5)		G or C	(3)
87-68-3	Hexachlorobutadiene	(4)	(5)		G or C	(3)
77-47-4	Hexachlorocyclopentadiene	(4)	(5)		G or C	(3)
67-72-1	Hexachloroethane	(4)	(5)		G or C	(3)
62-75-9	N-Nitrosodimethylamine	(4)	(5)		G or C	(3)
621-64-7	N-Nitrosodi-n-propylamine	(4)	(5)		G or C	(3)
86-30-6	N-Nitrosodiphenylamine	(4)	(5)		G or C	(3)

FACILITY NAME: Omega Protein, Inc.
ADDRESS: P.O. Box 175
Reedville, VA 22539

Permit No. VA0003867
Attachment D
Page 2 of 2

DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY MONITORING

OUTFALL NO.

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL ⁽¹⁾	REPORTING RESULTS	SAMPLE TYPE ⁽²⁾	SAMPLE FREQUENCY
VOLATILES						
107-02-8	Acrolein	(4)	(5)		G	(3)
107-13-1	Acrylonitrile	(4)	(5)		G	(3)
108-90-7	Chlorobenzene (synonym = monochlorobenzene)	(4)	(5)		G	(3)
156-60-5	1,2-trans-dichloroethylene	(4)	(5)		G	(3)
78-87-5	1,2-Dichloropropane	(4)	(5)		G	(3)
542-75-8	1,3-Dichloropropene	(4)	(5)		G	(3)
74-83-9	Methyl Bromide	(4)	(5)		G	(3)
79-34-5	1,1,2,2-Tetrachloroethane	(4)	(5)		G	(3)
79-00-5	1,1,2-Trichloroethane	(4)	(5)		G	(3)
ACID EXTRACTABLES						
51-28-5	2,4-Dinitrophenol	(4)	(5)		G or C	(3)
534-52-1	2-Methyl-4,6-Dinitrophenol	(4)	(5)		G or C	(3)

Name of Principal Exec. Officer or Authorized Agent/Title

Signature of Principal Officer or Authorized Agent/Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Sec. 1001 and 33 U.S.C. Sec. 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)

Footnotes to Water Quality Monitoring Attachment D

- (1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

Units for the quantification level are micrograms/liter unless otherwise specified.

Quality control and quality assurance information shall be submitted to document that the required quantification level has been attained.

- (2) Sample Type

G = Grab = An individual sample collected in less than 15 minutes. Substances specified with "grab" sample type shall only be collected as grabs. The permittee may analyze multiple grabs and report the average results provided that the individual grab results are also reported. For grab metals samples, the individual samples shall be filtered and preserved immediately upon collection.

C = Composite = A 24-hour composite unless otherwise specified. The composite shall be a combination of individual samples, taken proportional to flow, obtained at hourly or smaller time intervals. The individual samples may be of equal volume for flows that do not vary by +/- 10 percent over a 24-hour period. For composite metals samples, the individual sample aliquots shall either be filtered and preserved immediately upon collection, prior to compositing, or the composited sample shall be filtered and preserved immediately after compositing.

- (3) Once within one year of the effective date of the permit.
- (4) Any approved method presented in 40 CFR Part 136.
- (5) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.

CONDITIONS APPLICABLE TO ALL VPDES PERMITS

A. Monitoring.

1. Samples and measurements taken as required by this permit shall be representative of the monitored activity.
2. Monitoring shall be conducted according to procedures approved under Title 40 Code of Federal Regulations Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this permit.
3. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will insure accuracy of measurements.

B. Records.

1. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) and time(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years, the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee, or as requested by the Board.

C. Reporting Monitoring Results.

1. The permittee shall submit the results of the monitoring required by this permit not later than the 10th day of the month after monitoring takes place, unless another reporting schedule is specified elsewhere in this permit. Monitoring results shall be submitted to:

Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
2. Monitoring results shall be reported on a Discharge Monitoring Report (DMR) or on forms provided, approved or specified by the Department.
3. If the permittee monitors any pollutant specifically addressed by this permit more frequently than required by this permit using test procedures approved under Title 40 of the Code of Federal Regulations Part 136 or using other test procedures approved by the U.S.

Environmental Protection Agency or using procedures specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the Department.

4. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

D. Duty to Provide Information.

The permittee shall furnish to the Department, within a reasonable time, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Board may require the permittee to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

E. Compliance Schedule Reports.

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized Discharges.

Except in compliance with this permit, or another permit issued by the Board, it shall be unlawful for any person to:

1. Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances; or
2. Otherwise alter the physical, chemical or biological properties of such state waters and make them detrimental to the public health, or to animal or aquatic life, or to the use of such waters for domestic or industrial consumption, or for recreation, or for other uses.

G. Reports of Unauthorized Discharges.

Any permittee who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance into or upon state waters in violation of Part II F; or who discharges or causes or allows a discharge that may reasonably be expected to enter state waters in violation of Part II F, shall notify the Department of the discharge immediately upon discovery of the discharge, but in no case later than 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the Department, within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;

7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

Discharges reportable to the Department under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of Unusual or Extraordinary Discharges.

If any unusual or extraordinary discharge including a bypass or upset should occur from a treatment works and the discharge enters or could be expected to enter state waters, the permittee shall promptly notify, in no case later than 24 hours, the Department by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse affects on aquatic life and the known number of fish killed. The permittee shall reduce the report to writing and shall submit it to the Department within five days of discovery of the discharge in accordance with Part II I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service some or all of the treatment works; and
4. Flooding or other acts of nature.

I. Reports of Noncompliance

The permittee shall report any noncompliance which may adversely affect state waters or may endanger public health.

1. An oral report shall be provided within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which shall be reported within 24 hours under this paragraph:
 - a. Any unanticipated bypass; and
 - b. Any upset which causes a discharge to surface waters.
2. A written report shall be submitted within 5 days and shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
 - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Board may waive the written report on a case-by-case basis for reports of noncompliance under Part II I if the oral report has been received within 24 hours and no adverse impact on state waters has been reported.

3. The permittee shall report all instances of noncompliance not reported under Parts II I 1 or 2, in writing, at the time the next monitoring reports are submitted. The reports shall contain the information listed in Part II I 2.

NOTE: The immediate (within 24 hours) reports required in Parts II G, H and I may be made to

the Department's Piedmont Regional Office at (804) 527-5020 (fax 804-527-5106) and this shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Services maintains a 24 hour telephone service at 1-800-468-8892.

J. Notice of Planned Changes.

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - a. The permittee plans alteration or addition to any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:
 - (1) After promulgation of standards of performance under Section 306 of Clean Water Act which are applicable to such source; or
 - (2) After proposal of standards of performance in accordance with Section 306 of Clean Water Act which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal;
 - b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations nor to notification requirements specified elsewhere in this permit; or
 - c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
2. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

K. Signatory Requirements.

1. Applications. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

- b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a public agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
2. Reports, etc. All reports required by permits, and other information requested by the Board shall be signed by a person described in Part II K 1, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. The authorization is made in writing by a person described in Part II K 1;
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and
 - c. The written authorization is submitted to the Department.
3. Changes to authorization. If an authorization under Part II K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II K 2 shall be submitted to the Department prior to or together with any reports, or information to be signed by an authorized representative.
4. Certification. Any person signing a document under Parts II K 1 or 2 shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to Comply.

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the State Water Control Law and the Clean Water Act, except that noncompliance with certain provisions of this permit may constitute a violation of the State Water Control Law but not the Clean Water Act. Permit noncompliance is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this permit has not yet been modified to incorporate the requirement.

M. Duty to Reapply.

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. All permittees with a currently effective permit shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Board. The Board shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

N. Effect of a Permit.

This permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State Law.

Nothing in this permit shall be construed to preclude the institution of any legal action under, or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by Section 510 of the Clean Water Act. Except as provided in permit conditions on "bypassing" (Part II U), and "upset" (Part II V) nothing in this permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

P. Oil and Hazardous Substance Liability.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Sections 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

Q. Proper Operation and Maintenance.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

R. Disposal of solids or sludges.

Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering state waters.

S. Duty to Mitigate.

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to Halt or Reduce Activity not a Defense.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

U. Bypass.

1. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II U 2 and U 3.
2. Notice
 - a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, prior notice shall be submitted, if possible at least ten days before the date of the bypass.
 - b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part II I.
3. Prohibition of bypass.
 - a. Bypass is prohibited, and the Board may take enforcement action against a permittee for bypass, unless:
 - (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (3) The permittee submitted notices as required under Part II U 2.
 - b. The Board may approve an anticipated bypass, after considering its adverse effects, if the Board determines that it will meet the three conditions listed above in Part II U 3 a.

V. Upset.

1. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of Part II V 2 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.
2. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - b. The permitted facility was at the time being properly operated;



- c. The permittee submitted notice of the upset as required in Part II I; and
 - d. The permittee complied with any remedial measures required under Part II S.
3. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and Entry.

The permittee shall allow the Director, or an authorized representative, upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and the State Water Control Law, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. Permit Actions.

Permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Y. Transfer of permits.

1. Permits are not transferable to any person except after notice to the Department. Except as provided in Part II Y 2, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued, or a minor modification made, to identify the new permittee and incorporate such other requirements as may be necessary under the State Water Control Law and the Clean Water Act.
2. As an alternative to transfers under Part II Y 1, this permit may be automatically transferred to a new permittee if:
 - a. The current permittee notifies the Department at least 30 days in advance of the proposed transfer of the title to the facility or property;
 - b. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and
 - c. The Board does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part II Y 2 b.

Z. Severability.

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

WATER CIVIL CHARGE WORKSHEET Omega 2006 #4

1. Gravity-based Component			Serious	Moderate	Marginal	
a. Violations and Frequency per MONTH unless noted			\$\$ x occurrences	\$\$ x occurrences	\$\$ x occurrences	SUBTOTAL
Effluent Limits	Y	N	2500 x 2*	500 x 5	200 x	\$7,500
Operational Deficiencies	Y	N	1K x	500 x	200 x	
Monitoring/Submissions	Y	N	1K x	500 x	200 x	
Bypasses/ Overflows per day	Y	N	500 x	300 x	100 x	
Spills/Unpermitted Discharge/Withdrawal per event	Y	N	10K x	5K x	1K x	
Compliance/Construction/Payment Schedules	Y	N	1K x	500 x	200 x	
No Permit/ODCP	Y	N	2K x	1K x	500 x	
Failure to Report per event, per month	Y	N	10K x	5K x	1K x	
					Subtotal #1a	7,500
b. Aggravating Factors as Multipliers						
Major Facility?	Y	N	Subtotal #1a x .2			\$1,500
Consent/Judicial Order Violations?	Y	N	Subtotal #1a x .5			\$3,750
Compliance History/Degree of Culpability?	Y	N	Subtotal #1a x .5			\$3,750
					Subtotal #1b	\$9,000
GRAVITY BASED COMPONENT TOTAL (Add Subtotal #1a and Subtotal #1b)					TOTAL #1	\$16,500
2. Cost of Injunctive Remedy estimated					TOTAL #2	~ \$20,000
3. Violation/Cost Combined Total						
Add TOTAL #1 and TOTAL #2					TOTAL #3	\$36,500
4. Economic Benefit of Noncompliance calculated from BEN					TOTAL #4	N/A
5. Baseline Civil Charge						
If TOTAL #3 (Viol./cost) is GREATER than TOTAL #4 (Econ. ben.), record TOTAL #3 result as SUBTOTAL #5a.					SUBTOTAL #5a	\$36,500
If TOTAL #3 (Viol./cost) is LESS than TOTAL #4 (Econ. ben.), record TOTAL #4 as SUBTOTAL #5a						
BASELINE CIVIL CHARGE TOTAL (Subtract TOTAL #2 from TOTAL #5a)					TOTAL #5	\$16,500
6. Adjustments circle all which apply						
Size/Type of Facility Owner	History of Compliance	Cooperativeness/ Quick Settlement	Promptness of Injunctive Response/Good Faith Effort to Comply	Ability to Pay	Strategic Considerations	
Maximum decrease 30% of Total #5					TOTAL #6	0
7. Final Recommended Civil Charge						

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

- | | |
|--|---|
| <input checked="" type="checkbox"/> State Water Control Law | <input checked="" type="checkbox"/> Clean Water Act |
| <input checked="" type="checkbox"/> Permit Regulation (DEQ VPDES Regulation) | <input checked="" type="checkbox"/> EPA Guidelines |
| <input checked="" type="checkbox"/> EPA NPDES Regulation (Federal Register) | <input checked="" type="checkbox"/> Water Quality Standards |
| <input type="checkbox"/> Other (explain) _____ | |

7. Licensed Operator Requirements: Class III

8. Reliability Class Designation: None (not a sewage discharge)
9. Permit Characterization: (Check as many as necessary)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Private | <input checked="" type="checkbox"/> Effluent Limited |
| <input type="checkbox"/> Federal | <input checked="" type="checkbox"/> Water Quality Limited |
| <input type="checkbox"/> State | <input checked="" type="checkbox"/> Toxics Monitoring Program Required |
| <input type="checkbox"/> POTW | <input type="checkbox"/> Pretreatment Program Required |
| | <input type="checkbox"/> Possible Interstate Effect |
| | <input checked="" type="checkbox"/> Compliance Schedule Required |
| | <input type="checkbox"/> Interim Limits in Permit |
| | <input type="checkbox"/> Interim Limits in Other Document |

EPA has established effluent guidelines for selected industries: see the list of effluent guidelines found in Permit Regulations for numbers and names. Also see the BNA book.

See the WQ Standards for applicable standards and criteria.

For applicants who need a TMP when they meet any conditions as listed on Appendix II, Guidelines for Application of TMP.

See the Pretreatment Manual if they have industrial discharges into a municipal POTW.

10. Attach a schematic of Wastewater Treatment System(s), and provide a general description of the production cycle(s) and activities of the facility.

See attached. This facility processes menhaden when available during the months of March through December.

11. Discharge(s) Location Description: Provide USGS Topo which indicates the discharge location, significant (large) dischargers to the receiving stream, water intakes, and other items of interest.

Name of Topo: Reedville

12. Discharge Description: See Table I.

13. Receiving Waters Information: (This narrative is from the 1992 VWCB 305b Report to Congress, with updates from more recent reports in brackets):

The Cockrell's Creek waterbody encompasses the area southeast and east of Lilian on Rte. 360 to the

confluence with Ingram Bay and Chesapeake Bay, including Cockrell Creek's and numerous unnamed coves. This waterbody is classified as effluent limited.

The VWCB (now DEQ) maintains an AWQM station near Reedville (COC001.61). The data from the current reporting period exhibited no violations of dissolved oxygen, pH, temperature, or fecal coliform bacterial standards over a 10% rate. [The 1994 report also shows none of these violations; the 1996 report shows one D.O. and one fecal coliform violation.] Historically, this station has shown low dissolved oxygen levels, which have been attributed to seasonal problems. However, during this reporting period, only 5% of the samples violated the standard. Copper was found in water column samples above the chronic criterion.

Note: AWQM sampling for metals has been in the total recoverable form; the water quality standards and wasteload allocations are based on dissolved metals. DEQ's guidance from 93-015 states that there is no general relationship in the stream or in the effluent between total recoverable metals and dissolved metals (other than what can be determined via a site specific chemical translator study). Therefore, total recoverable metals data should not be used to establish a permit limit to represent dissolved metals. The necessity for a limit may be ruled out using total recoverable data, however. The 1994 and 1996 reports do not indicate any metals violations. Using the DEQ current guidance, the statement that sampling data show metals violations in Cockrell Creek's in 1992 was most likely incorrect.

Shellfish condemnations impact 826 acres. The closures are associated with the buffer zone surrounding the discharge from the Town of Reedville WWTP and non-point source pollutants. Four seafood facilities also discharge to Cockrell's Creek.

Note: Two seafood fish-packing facilities, Pride of Virginia and Reedville Menhaden presently discharge to Cockrell's Creek, in addition to the menhaden plant.

The CWA fishable goal for this waterbody, which covers 1.29 square miles of surface water, is partially supported for the entire waterbody. The swimmable goal is fully supported for the entire waterbody.

In addition to the information about Cockrell's Creek, the Chesapeake Bay is the discharge location for outfall 003 and refrigeration water. The 003 wastewater is barged out to a designated quadrant in the Bay, diluted with seawater, and discharged below the barge. This method of disposal has not been used in over 15 years, but it is retained in case of emergency. Sufficient dilution is possible provided the barge discharge pumps dilute the wastewater with seawater such that no water quality violations are expected. Refrigeration water is used to cool the fish as they are brought to the plant for processing. After the ships drop off their menhaden catch, they head back out to fish. Once they reach a point east of a line between Fleeton Point Light and Black Can Buoy No. 3, they discharge the refrigeration water in compliance with water quality standards while the vessel is underway and at such a rate that the discharge is not visible.

14. Effluent Screening: See Tables III-VII. If available, reference the specific chemical data used in the mass balance and the specific identifying information (lab sheet number, lab data, etc.).
15. Effluent Limitations: Include all calculations used for each outfall and set of effluent limits. See Tables II and VIII-XI. Justification for variances and modifications must be addressed in this Section. Also, attach calculations used in the model(s) to this fact sheet. Provide a rationale for limiting internal wastestreams and indicator pollutants.
16. Special Conditions: Give a brief rationale for any special conditions contained in the permit (pretreatment information, toxic pollutants, TMP rationale, etc.).

- B.1. Quantification Levels for Toxic Parameters--from Quantification Guidance dated August, 1999. States are authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, subpart 130.4.
- B.2. Bay Discharge (003) Requirements - based on the previous permit. Monitoring required to ensure discharges meet water quality standards.
- B.3. Refrigeration Water Discharge Requirements - based on the previous permit. Monitoring required to ensure discharges meet water quality standards.
- B.4. Industrial Reopener - Rationale: Required to implement 9 VAC 25-31-220, §C. 40 CFR 122.44 requires all permits for primary industry categories to include the requirements of Section 307(a)(2) of the Clean Water Act.
- B.5. Notification levels of Toxics - Rationale: Required in permits by 96-004 for existing manufacturing, commercial, mining, and silvicultural dischargers).
- B.6. Waste Storage Special Condition. Rationale: 9 VAC 25-31-50, §A. prohibits the discharge of any wastes into State waters unless authorized by permit. State Water Control Law §62.1-44.18:2 authorizes the Board to prohibit any waste discharge which would threaten public health or safety, interfere with, or be incompatible with treatment works or water use. Section 301 of the Clean Water Act prohibits the discharge of any pollutant unless it complies with specific sections of the Act.
- B.7. Nutrient Enriched Waters. Rationale: 9 VAC 25-40, Policy for Nutrient Enriched Waters, allows reopening of permits if total phosphorus and total nitrogen in a discharge potentially exceed specified concentrations. The policy also anticipates that future nutrient limits may be needed to control aquatic plants.
- B.8. Operations and Maintenance Manual. Rationale: 9 VAC 25-31-190, §E. and 40 CFR 122.41(e) require proper operation and maintenance of the permitted facility. Compliance with an approved O&M manual ensures this. Section 401 of the Clean Water Act requires the permittee to provide opportunity for the State to review the proposed operations of the facility.
- B.9. Requirement for Class III Operator. The VDH/SWCB Sewerage Regulations specify a manning and classification schedule of wastewater treatment plant operators, based on plant capacity and specific treatment types. The Code of Virginia 54.1-3200 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators, requires licensure of operators.
- B.10. Submittal of Item V and VI of Form 2C for outfall 005, or alternatively, 006. This is required because the outfall was not in operation for the collection of representative samples when the application was submitted.
- B.11. Best Management Practices: Off Season Maintenance Area. Because this facility scrapes and paints boats, the shipyard BMPs have been added to this permit, along with a reporting form (Attachment C).
- B.12. Water Quality Standards Monitoring. State Water Control Law 62.1-44.21 authorized the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. If modifications to secondary treatment requirements are proposed, 40 CFR Part 125, Criteria and Standards for the NPDES, subpart 125.62 requires the establishment of a monitoring program. Water Quality Standards Reopener. VR 680-14-01, Section 2.5. E. Water Quality Standards dictates that permits shall include limits to prevent violations of water quality standards. CFR Part 131, Water Quality Standards, requires the State to adopt water quality criteria to protect designated water uses (subpart 131.11), and review, modify and adopt water quality standards periodically (subpart 131.20). Section 302 of the Clean water Act authorizes effluent limitations to be established which will contribute to the attainment or maintenance of the water quality.

Betsy Ziomek, QA/QC Officer for DEQ, advised me that because organics can stick to the side of the compositor, 3 grabs over the 24 hr. operations cycle would be better than the composite sample recommended in the current 93-015 guidance update document for pesticides/pcbs, base neutrals extractables and acids extractables.

- B.13. Compliance Schedule for Ammonia Limitation at Outfall 001/006, 002 and 003 and Cyanide at 001/006. Per 93-015, if the permit action is a reissuance or a modification, and a water quality based limit is incorporated into the permit for the first time, then a schedule of compliance for meeting the new limit may be incorporated into the permit. This is carried over from the permit reissued December 17, 1997.
- B.14. Multiport Diffuser at 002. Omega has indicated that they will construct a multiport diffuser at outfall 002. The construction must be approved and the device in place prior to December 17, 2001 as part of plans for the facility to meet its compliance schedule (see B.11).
- B.15. Monthly Average and Daily Maximum Compliance. States are authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per CFR Part 130, Water Quality Planning and Management, subpart 130.4. Consistency in how this is to be accomplished is critical.
- C.1. Toxics Management Program. Outfall 001/006: This condition is required based on the Applicability Criteria of the Toxics Management Regulation. The daily maximum wastewater flow from these outfalls is greater than 50,000 gallons per day and a reasonable potential for toxicity exists in the wastewater as this outfall contains contact cooling water, which comes in contact with the dryer scrubbers. Outfall 002 (treated wastewater from lagoon) has completed a Toxicity Reduction Evaluation (TRE), and a Whole Effluent Toxicity (WET) limit has been applied in accordance with the recommendation made September 10, 1997 by Mason Harper. Outfall 003, the barge discharge, has not been used since before 1989; however, since the treated wastewater has been shown to be potentially toxic, the untreated wastewater barged out to the Bay may also be potentially toxic, a requirement for TMP testing to begin has been included should this outfall be used. It has been demonstrated through quarterly testing over the 1992-1997 permit term that Outfall 004 (Non-contact cooling water) is not acutely or chronically toxic, so TMP requirements have been dropped for this outfall in the permit reissued December 17, 1997. Because the new 005 outfall will also consist of the same noncontact cooling water, a TMP requirement has not been imposed on it. However, when it is combined with 001 and 004 as outfall 006, the annual TMP requirement that was imposed upon 001 will remain.
17. List the type and quantity of wastes, fluids, or pollutants being stored at this facility. Briefly describe the storage facilities and list, if any, measures taken to prevent the stored material from reaching State waters.
- A. Marine Paints for touchup work on the menhaden boats. Brushwork only, instead of spraying, is done at this facility.
- B. Sulfuric Acid for the scrubbers. The acid is stored so that it does not come in contact with stormwater or wastewater.
- C. Oils in ASTs. These are stored inside bermed areas in case of leakage of one of the tanks.
18. Table XIII is to be used to record changes in the permit (1) from the previously issued permit and/or (2) during the permit processing period.
- Special Conditions: (List any changes associated with the special conditions and the reasons for the changes).

- Condition 1. Quantification Levels. Required by updated Quantification Level guidance dated August, 1999.
- Condition 2. Pump Rate/Barge Speed. These were developed by Ampro with the aid of a marine architect in order to provide the appropriate amount of mixing so that the waste is disposed of by the barge in a manner that is not toxic.
- Condition 4. Industrial Reopener. Standard language has changed.
- Condition 6. Addition of standard permit condition per OWPS guidance.
- Condition 7. Storage Condition is new to this reissuance; permit manual requires addition.
- Condition 9. Licensed Wastewater operator. Standard language has been updated.
- Condition 10. Condition for Form 2C Section V and VI for Outfall 005 or 006 to complete the application.
- Condition 12. Water Quality Standards Monitoring Condition was new to the 1997 reissuance; the permittee is to collect data during the current permit cycle so the need for limits may be evaluated at the next permit reissuance. The language and analysis frequency has been updated in this modification in accordance with the most recent guidance and extended to include outfall 005 and 006. Also, target values for metals have been updated in accordance with final Attachment A guidance from Central Office dated August 25, 1999.
- Condition 13. Proposed outfall 006 has been added to the schedule of compliance for ammonia and cyanide.

Table I
NUMBER AND DESCRIPTION OF DISCHARGES
(Complete this item or attach page one of Form 2C)

OUTFALL NUMBER AND LOCATION	SOURCE OF DISCHARGE (LIST OPERATION CONTRIBUTING FLOW)	TREATMENT (BRIEF DESCRIPTION UNIT BY UNIT)	FLOW AVERAGE/MAXIMUM (GIVE AVG & MAX FOR INDUSTRY & DESIGN FOR MUNICIPAL)
001 Cockrell's Creek	Processing Menhaden: Contact Cooling water from Dryer Scrubbers; Emergency Discharge of Evaporation Condensate	Evaporation	5.0 MGD average and long term average flow; 7.17 MGD maximum flow
002 Cockrell's Creek	Processing Menhaden: the aerated lagoon treatment of the condensate.	Aeration, detention	0.3 MGD average flow, 0.26 MGD long term avg flow; 0.468 MGD maximum flow
003 Chesapeake Bay	Processing Menhaden: Evaporation Condensate.	Evaporation	0.3 MGD long term avg. flow, 0.4 MGD max (measured in barge-fuls of condensate, at 0.2 MGD per barge)
004 Cockrell's Creek	Processing Menhaden: Non-contact Cooling water from Evaporation Units	Evaporation	8.6 MGD average flow; 12.4 MGD maximum flow
005 Cockrell's Creek	Processing Menhaden: Non-contact Cooling water from Evaporation Units (new unit)	Evaporation	Average flow 10.32 MGD; 12.9 MGD maximum flow
006 Cockrell's Creek	Processing Menhaden: Combined Contact and Non-contact Cooling Water; Emergency Discharge of Evaporation Condensate	Evaporation	Average flow 23.92 MGD; 32.47 MGD maximum flow--will not be a new flow, combines 001+004+005
East of Fleeton Point Light and Black Can Buoy #3	refrigeration water (from ships)	none	unknown: subject to criteria that the discharge be made while the ship is underway and at a rate such that the discharge is not visible.
Stormwater handled by General Permit	Stormwater Monitoring at Outfall 001	none	Unknown at this time: monitored under general permit

Bailwater is creekwater used to transfer the fish off the boat hydraulically to shore at the dock. The bailwater goes through the process so what water is not evaporated is discharged through outfall 001.

The boat engines require cooling water and a discharge of the engine cooling water may be seen at the dock if the engines are running waiting to unload the fish catch.

Slickwater is wastewater from the fish cooker that has been pressed and centrifuged. It consists of 10 percent solids. It is further evaporated to condensate, which is 10 percent solids. The condensate is treated with the aerated lagoon and discharged to Cockrell's Creek at outfall 002 or may be barged to 003 (though the 003 outfall has been used in over 15 years).

Omega Protein Calculation of Conventional Limits

Table 11

Production (from 2C Application) 3,200,000 Kg; Calculation of Technology Limits for 001, 002, 003

*Long Term Average Loadings Used from 2C application:		Scrubber 001 5 MGD 698 kg/d BOD Long Term Avg 416 kg/d TSS, 101 kg/d O&G		Lagoon 002 0.26 MGD 186 kg/d BOD Long Term Avg 100 kg/d TSS, 7.5 kg/d O&G		Barge 003 0.3 MGD 464 kg/d BOD Long Term Avg 12.8 kg/d TSS, 23.1 kg/d O&G	
	Multiplier K/KKG	Total Kg/D = (Production x multiplier/1000)		Kg/D total x (proportion 001 loading/total loading)		Kg/D total x (proportion 002 loading/total loading)	Kg/D total x (proportion 003 loading/total loading)
BOD ₅	Avg 3.0	12480	001 BOD Loading/Total Loading = 600/1348 = 0.5178	12480 x .5178 = 6462 Kg/d	002 BOD Loading/Total Loading = 186/1348 = 0.1380	1722 Kg/d	003 BOD Loading/Total Loading = 464/1348 0.3442
Total BOD Loading* = 698 + 186 + 464 = 1348 kg/d	Max 7.0	22400		22400 x .5178 = 11599		3091	7710
TSS	Avg 1.5	4800	001 TSS Loading/Total Loading = 0.7735	3713	002 TSS Loading/Total Loading = 0.2027	973	003 TSS Loading/Total Loading = 0.0238
Total TSS Loading* = 416 + 100 + 12.8 = 538 kg/d	Max 3.7	11,840		9150		2400	282
O&G	Avg 0.75	2,432	001 O&G Loading/Total Loading = 0.7052	1861	002 O&G Loading/Total Loading = 0.0560	138	003 O&G Loading/Total Loading = 0.1750
Total O&G Loading* = 101 + 7.5 + 23.1 = 132 Kg/d	Max 1.4	4,480		3418		254	426

HOWEVER, WQS DICTATE TOTAL ALLOWABLE BOD DISCHARGE TO CREEK IS 4000 LB/DAY AFTER THE WLA FOR THE REEVOILLE WWTP HAS BEEN SUBTRACTED. FRED CUNNINGHAM'S FACT SHEET DATED 8/20/84 ALLOWED A TOTAL OF 2222 KG/D. THIS HAS BEEN ALLOCATED IN ITS ENTIRETY TO OMEGA PROTEIN WITH THIS PERMIT MODIFICATION. THEREFORE THE SUM OF BOD FOR 001 AND 002, THE TWO PROCESS OUTFALLS DISCHARGING TO CREEK, CANNOT EXCEED 2222 KG/D, AND WQS LIMITS APPLY TO THESE 2 OUTFALLS. 003 IS LIMITED BY TECHNOLOGY LIMITS.

		Kg/d Total Wasteload Allocation 001+002	Scrubber 001 5 MGD	Lagoon 002 0.26 MGD
BOD ₅	Avg	2222 *	001 BOD Loading/Total Loading = 0.7896	002 BOD Loading/Total Loading = 0.2104
Total BOD Loading* = 698 + 186 = 884 kg/d	Max 2222 kg/d x (7.0/3.0) Mo. Max. Calculation: (Mo Avg. Kg/D multiplied by ratio of max/avg multiplier)	3909 *	2222 x .7896 = 1754 *	468 Kg/d
			3909 x .7896 = 3150 *	830 *
TSS	Avg 2222 Kg/D x (1.5/3.0) Ratio TSS Avg/BOD Avg Multipliers	855 *	001 TSS Loading/Total Loading = 0.7024	002 TSS Loading/Total Loading = 0.2075
Total TSS Loading* = 416 + 100 = 525 kg/d	Max 2222 kg/d x (3.7/7.0) Ratio TSS Max/BOD Max Multipliers	1,174 *	855 x .7024 = 670 *	177 *
			830 *	244 *
O&G	Avg 2222 Kg/d x (.75/3.0) Ratio O&G Avg/BOD Avg Multipliers	433 *	001 O&G Loading/Total Loading = 0.0300	002 O&G Loading/Total Loading = 0.0581
Total O&G Loading* = 101 + 7.5 = 108.5 Kg/d	Max 2222 kg/d x (1.4/7.0) Ratio O&G Max/BOD Max Multipliers	444 *	403 *	29.0 *
			413 *	30.7 *

Table 11A

Table IIA

Omega Protein Permit Limits Calculation 11-9-99

TSS and O&G Max Value Calculations-- Revisions to Table II

TSS and O&G Max values should have been calculated by multiplying max multiplier ratios by the max BOD value, not the avg value. This resulted in max values for 001 and 002 (and the proposed 006) that were too low.

TSS calculation
 $3989 \text{ kg/d} * (3.7 \text{ TSS max multiplier} / 7.0 \text{ BOD max multiplier}) = 2108$

O&G Calculation
 $3989 \text{ kg/d} * (1.4 \text{ O&G max multiplier} / 7.0 \text{ BOD max multiplier}) = 798$

Comparison of Calculated Values to Previously Permitted Limits
 WQ Limits from Previous Permits--Zapata and Ampro: 001+002

		Zapata	Ampro	Total	New Rev. Omega limits	Use (Total or New Lim)
BOD	AVG	1356	867	2223	2222	2223
	MAX	2427	1552	3979	3989	3979
TSS	AVG	504	322	826	855	826
	MAX	1239	792	2031	2108	2031
O&G	AVG	244	156	400	433	400
	MAX	449	287	736	798	736

Since the Values in the Use Column above represent the sum of 001+ 002, the next step is to split the sum into separate outfall values using the (outfall loading)/(total loading) proportions found in Table II

	Outfall 001	Outfall 002
BOD avg	$2223 * 0.7896 = 1755$	$2223 * 0.2104 = 468$
max	$3979 * 0.7896 = 3142$	$3979 * 0.2104 = 837$
TSS avg	$826 * 0.7924 = 655$	$826 * 0.2076 = 171$
max	$2031 * 0.7924 = 1609$	$2031 * 0.2076 = 422$
O&G avg	$400 * 0.9309 = 372$	$400 * 0.0691 = 27.6$
max	$736 * 0.9309 = 685$	$736 * 0.0691 = 50.9$

Table III

EVALUATION OF EFFLUENT CHARACTERIZATION DATA--The only new data received for evaluation has been ammonia and cyanide, therefore these were the only two parameters evaluated for the permit modification. Evaluation of other parameters has been carried over from 12/97 permit reissuance.

Outfall 001

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow: 5.0 MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		Data from 2C application evaluated and all units ug/l, unless otherwise specified *Measured as Dissolved species
				Acute (WLA _a)	Chronic (WLA _c)	
						Acute (WLA _a) is calculated as follows: 2x acute standard for estuarine, per 93-015) ug/l Chronic (WLA _c) is calculated as follows: 50x chronic standard for estuarine, per 93-015) ug/l
Aldrin	believed absent	1.3	0.13			Limit not evaluated
Ammonia	1998 season values, see WLA program page	1.05 mg/l	0.16 mg/l	2.10	7.90	Max daily limit of 2.1 mg/l and average monthly limit of 1.68 mg/l determined.
Arsenic-trivalent, inorganic	50 measured as Total Recoverable	69*	36*	138*	1800*	No limit indicated after evaluation
Cadmium	3 measured as Total Recoverable	43*	9.3*	86*	465*	No limit indicated after evaluation

PARAMETER	EFFLUENT CONCENTRATION	VIRGINIA ACUTE CRITERIA SALTWATER	VIRGINIA CHRONIC CRITERIA SALTWATER	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Chlordane	ug/l believed absent	0.09 ug/l	0.004 ug/l	0.18	0.2	Data from 2C application evaluated and all units ug/l, unless otherwise specified Limit not evaluated *Measured as Dissolved species
Chromium-hexavalent	30 measured as Total Recoverable	1100*	50*	2200*	2500*	No limit indicated after evaluation of Total Cr
Chromium-trivalent	30 measured as Total Recoverable		No Saltwater value			Limit not evaluated
Copper, Total Recoverable	80 measured as Total Recoverable	2.9*	2.9*	5.8*	145*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Cyanide, Total	1998 season values, see WLA program page	1.0	1.0	2	50	Mo. Avg limit of 1.54 ug/l, Max Daily limit of 2 ug/l determined
DDT	believed absent	0.13	0.001	0.26	0.05	Limit not evaluated
Demeton	no information available		0.1			Limit not evaluated
Dieldrin	believed absent	0.71	0.0019	1.42	0.095	Limit not evaluated
Endosulfan	believed absent	0.34	0.0087	0.068	0.435	Limit not evaluated
Endrin	believed absent	0.037	0.0023	0.074	0.115	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION	VIRGINIA ACUTE CRITERIA SALTWATER	VIRGINIA CHRONIC CRITERIA SALTWATER	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Guthion	no information available	ug/l	0.01 ug/l		0.5	Data from 2C application evaluated and all units ug/l, unless otherwise specified Limit not evaluated *Measured as Dissolved species
Heptachlor	believed absent	0.053	0.0036	0.106	0.18	Limit not evaluated
Hydrogen Sulfide	believed absent		2.0		100	Limit not evaluated
Iron	400 measured as Total Recoverable		No Saltwater Value			Limit not evaluated
Kepone	No information available		0			Limit not evaluated
Lead	120 Total recoverable	220*	8.5*	440*	425*	No limit indicated after evaluation
Lindane	believed absent	0.16	0.01	0.32	0.5	Limit not evaluated
Malathion	No information available		0.1			Limit not evaluated
Manganese	believed absent		100*			Limit not evaluated
Mercury	believed absent	2.1 *	0.025 *	4.2*	1.25*	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION	VIRGINIA ACUTE CRITERIA SALTWATER	VIRGINIA CHRONIC CRITERIA SALTWATER	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Methoxychlor	No information available	ug/l	0.03 ug/l		1.5*	Data from 2C application evaluated and all units ug/l, unless otherwise specified Limit not evaluated *Measured as Dissolved species
Mirex	No information available		0			Limit not evaluated
Nickel	40 Total Recoverable	75*	8.3*	150*	415*	All data less than WLA; no limit necessary
Parathion	No information available		0.04			Limit not evaluated
Phenol	10, measured as total phenol					(Human health standard of 4600000)
Phthalate Esters	believed absent		3.0			Limit not evaluated
Polychlorinated Biphenyls	believed absent		0.03		1.5	Limit not evaluated
Selenium	600 Total Selenium	300*	71*	600*	3550*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Silver	40 Total Recoverable	2.3 *		4.6*		No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015

PARAMETER	EFFLUENT CONCENTRATION	VIRGINIA ACUTE CRITERIA SALTWATER	VIRGINIA CHRONIC CRITERIA SALTWATER	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Toxaphene	ug/l believed absent	0.21 ug/l	0.0002 ug/l	0.42	0.01	Data from 2C application evaluated and all units ug/l, unless otherwise specified Limit not evaluated *Measured as Dissolved species
Tributyltin	(Total Tin believed absent--no TBT used onsite)					Limit not evaluated
Zinc	30 Total Recoverable	95*	86*	190*	4300*	No limit necessary after evaluation

Table IV

EVALUATION OF EFFLUENT CHARACTERIZATION DATA--The only new data received for evaluation has been ammonia and cyanide, therefore these were the only two parameters evaluated for the permit modification. Evaluation of other parameters has been carried over from 12/97 permit reissuance.

Outfall 002

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow: 0.26 MGD (Flow of effluent used in calculating mass balance)

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified, all units ug/l unless specified *Measured as Dissolved species
				AVG FLOW		
				Acute (WLA _a) (23 x acute standard for estuarine, per D. Phillips diffuser evalutation) ug/l	Chronic (WLA _c) (50x chronic standard default for estuar- ine, per D. Phillips guidance) ug/l	
Aldrin	believed absent	1.3	0.003			Limit not evaluated
Ammonia	1998 season values, see WLA program page	0.49 mg/l	0.07 mg/l	11.27 mg/l	3.71 mg/l	Avg. Mo. limit 38.0 mg/l, Max daily limit 46.0 mg/l determined.
Arsenic-trivalent, inorganic	20 measured as Total Recoverable	69*	36*	1587*	1800*	No limit necessary; datum less than QL of less than WLA
Cadmium	believed absent	43*	9.3*	989*	465*	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified, all units ug/l unless specified
				AVG FLOW		
Chlordane	believed absent	0.09	0.004	2.07	0.2	*Measured as Dissolved species Limit not evaluated
Chromium-hexavalent	20 measured as Total Recoverable	1100*	50*	25300*	2500*	Total Chromium value of 20 ug/l used to show no Cr VI limit necessary
Chromium-trivalent	20 measured as Total Recoverable		No Saltwater value			Limit not evaluated
Copper, Total Recoverable	100 measured as Total Recoverable	2.9*	2.9*	66.7*	145*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Cyanide, Total	1998 season values, see WLA program page	1.0	1.0	101	101	No limit is required for cyanide.
DDT	believed absent	0.13	0.001	2.99	0.05	Limit not evaluated
Demeton	no information available		0.1			Limit not evaluated
Dieldrin	believed absent	0.71	0.0019	16.33	0.095	Limit not evaluated
Endosulfan	believed absent	0.34	0.0087	7.82	0.435	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified, all units ug/l unless specified
				AVG FLOW		
Endrin	believed absent	0.037	0.0023	0.851	0.115	*Measured as Dissolved species Limit not evaluated
Guthion	no information available		0.01		0.5	Limit not evaluated
Heptachlor	believed absent	0.053	0.0036	1.219	0.18	Limit not evaluated
Hydrogen Sulfide	believed absent		2.0		100	Limit not evaluated
Iron	Total Iron believed absent		No Saltwater Value			Limit not evaluated
Kepone	No information available		0			Limit not evaluated
Lead	10 Total recoverable	220*	8.5*	5060*	425*	No limit indicated after evaluation
Lindane	believed absent	0.16	0.01	3.68	0.5	Limit not evaluated
Malathion	No information available		0.1			Limit not evaluated
Manganese	believed absent		100			Limit not evaluated
Mercury	believed absent	2.1 *	0.025 *	48.3*	1.25*	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified, all units ug/l unless specified
				AVG FLOW		
Methoxychlor	No information available		0.03		1.5	*Measured as Dissolved species Limit not evaluated
Mirex	No information available		0			Limit not evaluated
Nickel	50 Total Recoverable	75*	8.3*	1725*	415*	All data less than WLA; no limit necessary
Parathion	No information available		0.04			Limit not evaluated
Phenol	6, measured as Total Phenol					(Human health standard of 4600000) Limit not evaluated
Phthalate Esters	believed absent		3.0			Limit not evaluated
Polychlorinated Biphenyls	believed absent		0.03		1.5	Limit not evaluated
Selenium	2 Total Selenium	300*	71*	6900*	3550*	No limit indicated after evaluation
Silver	50 Total Recoverable	2.3 *		52.9*		All data less than WLA, no limit necessary
Toxaphene	believed absent	0.21	0.0002	4.83	0.01	Limit not evaluated

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified, all units ug/l unless specified
				AVG FLOW		
Tributyltin	(Total Tin believed absent--no TBT used onsite)					Measured as Dissolved species Limit not evaluated
Zinc	10 Total Recoverable	95*	86*	2185*	4300*	All data less than WLA, no limit necessary

Table V

EVALUATION OF EFFLUENT CHARACTERIZATION DATA

Outfall 003 -The only new data received for evaluation has been ammonia, therefore this was the only parameter evaluated. Evaluation of other parameters has been carried over from 12/97 permit reissuance.

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow 0.30 MGD

Flow 0.30 MGD

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				AVG FLOW		
				Acute (WLA _a) (2x acute standard for estuarine, per 93- 015) ug/l	Chronic (WLA _c) (50x chronic standard for estuar- ine, per 93-015) ug/l	
Aldrin	believed absent	1.3	0.003			Limit not evaluated
Ammonia	420,202, 95,235, 252, 207, 132, 87, 109, 70, 64 mg/l (conden- sate to lagoon, 1996 values)	1.69	0.25	49.01 (Dilution ratio of 28:1 recommen- ded by Dale Phillips in note dated 8/17/98)	NA Chronic toxicity does not apply to discharge 3 hr. long)	Avg. Monthly limit of 39.6 mg/l, max daily limit of 49.0 mg/l determined.
Arsenic-trivalent, inorganic	believed absent	69*	36*	138*	1800*	Limit not evaluated

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				AVG FLOW		
Cadmium	39 measured as Total	43*	9.3*	86*	465*	No limit indicated after evaluation
Chlordane	believed absent	0.09	0.004	0.18	0.2	Limit not evaluated
Chromium-hexavalent	13 measured as Total Recoverable	1100*	50*	2200*	2500*	Total Chromium value of 13 ug/l used to show no Cr VI limit necessary
Chromium-trivalent	13 measured as Total Recoverable		No Saltwater value			Limit not evaluated
Copper	198 measured as Total Recoverable	2.9*	2.9*	5.8*	145*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Cyanide, Total	believed absent	1.0	1.0	2	50	No limit evaluated
DDT	believed absent	0.13	0.001	0.26	0.05	Limit not evaluated
Demeton	no information available		0.1			Limit not evaluated
Dieldrin	believed absent	0.71	0.0019	1.42	0.095	Limit not evaluated

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				AVG FLOW		
Endosulfan	believed absent	0.34	0.0087	0.068	0.435	Limit not evaluated
Endrin	believed absent	0.037	0.0023	0.074	0.115	Limit not evaluated
Guthion	no information available		0.01		0.5	Limit not evaluated
Heptachlor	believed absent	0.053	0.0036	0.106	0.18	Limit not evaluated
Hydrogen Sulfide	believed absent		2.0		100	Limit not evaluated
Iron	Total Iron believed absent		No Saltwater Value			Limit not evaluated
Kepone	No information available		0			Limit not evaluated
Lead	28 Total recoverable	220*	8.5*	440*	425*	No limit indicated after evaluation
Lindane	believed absent	0.16	0.01	0.32	0.5	Limit not evaluated
Malathion	No information available		0.1			Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form Limit not evaluated
				AVG FLOW		
Manganese	believed absent		100			
Mercury (as a standard)	believed absent	2.1*	0.025 *	4.2*	1.25*	All data below QL of 0.2 ug/l; no limit necessary.
Methoxychlor	No information available		0.03		1.5	Limit not evaluated
Mirex	No information available		0			Limit not evaluated
Nickel	140 Total Recoverable	75*	8.3*	150*	415*	No limit indicated after evaluation
Parathion	No information available		0.04			Limit not evaluated
Phenol	believed absent					(Human health standard of 4600000) Limit not evaluated
Phthalate Esters	believed absent		3.0			Limit not evaluated
Polychlorinated Biphenyls	believed absent		0.03		1.5	Limit not evaluated
Selenium	19 Total Selenium	300 *	71 *	600*	3550*	All data less than WLA; no limit necessary
Silver	0.5 Total Recoverable	2.3*		4.6*		All data less than WLA; no limit necessary

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form Limit not evaluated
				AVG FLOW		
Toxaphene	believed absent	0.21	0.0002	0.42	0.01	Limit not evaluated
Tributyltin	(Total Tin believed absent--no TBT used onsite)					Limit not evaluated
Zinc	111 Total Recoverable	95*	86*	190*	4300*	All data less than WLA; no limit necessary

Table VI

EVALUATION OF EFFLUENT CHARACTERIZATION DATA

Outfall 004 -The only new data received for evaluation has been ammonia, therefore this was the only parameter evaluated. Evaluation of other parameters has been carried over from 12/97 permit reissuance.
Receiving Stream: Hardness: NA (Saltwater Limits apply)
Flow 12.4MGD

Flow 12.4MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS Data from 2C application evaluated, unless otherwise specified * The metals form is the Dissolved form
				AVG FLOW		
				Acute (WLA _a) (2x acute standard for estuarine, per 93-015) ug/l	Chronic (WLA _c) (50x chronic standard for estuarine, per 93-015) ug/l	
Aldrin	believed absent	1.3	0.003			Limit not evaluated
Ammonia	1.46 mg/l	1.05	0.16	2.1 mg/l	7.9 mg/l	Avg. Mo. Limit of 1.71, Max daily limit of 2.1 determined.
Arsenic-trivalent, inorganic	50 measured as Total Recoverable	69*	36*	138*	1800*	No limit necessary; datum less than WLA ug/l
Cadmium	6 measured as Total Recoverable	43*	9.3*	86*	465*	No limit indicated after evaluation
Chlordane	believed absent	0.09	0.004	0.18	0.2	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG.FLOW		
Chromium-hexavalent	6 measured as Total Recoverable	1100*	50*	2200*	2500*	Data from 2C application evaluated, unless otherwise specified * The metals form is the Dissolved form Total Chromium value of 6 ug/l used to show no Cr VI limit necessary
Chromium-trivalent	2 measured as Total Recoverable		No Saltwater value			Limit not evaluated
Copper	40 measured as Total Recoverable	2.9*	2.9*	5.8*	145*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Cyanide, Total	believed absent	1.0	1.0	2	50	Limit determined not to be necessary after evaluation
DDT	believed absent	0.13	0.001	0.26	0.05	Limit not evaluated
Demeton	no information available		0.1			Limit not evaluated
Dieldrin	believed absent	0.71	0.0019	1.42	0.095	Limit not evaluated
Endosulfan	believed absent	0.34	0.0087	0.068	0.435	Limit not evaluated
Endrin	believed absent	0.037	0.0023	0.074	0.115	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Guthion	no information available		0.01		0.5	Data from 2C application evaluated, unless otherwise specified Limit not evaluated * The metals form is the Dissolved form
Heptachlor	believed absent	0.053	0.0036	0.106	0.18	Limit not evaluated
Hydrogen Sulfide	believed absent		2.0		100	Limit not evaluated
Iron	588 measured as Total Iron		No Saltwater Value			Limit not evaluated
Kepone	No information available		0			Limit not evaluated
Lead	100 Total recoverable	220*	8.5*	440*	425*	No limit indicated after evaluation
Lindane	believed absent	0.16	0.01	0.32	0.5	Limit not evaluated
Malathion	No information available		0.1			Limit not evaluated
Manganese	believed absent		100			Limit not evaluated
Mercury (as a standard)	believed absent	2.1*	0.025 *	4.2*	1.25*	All data below QL of 0.2 ug/l; no limit necessary.

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Methoxychlor	No information available		0.03		1.5	Data from 2C application evaluated, unless otherwise specified Limit not evaluated * The metals form is the Dissolved form
Mirex	No information available		0			Limit not evaluated
Nickel	10 Total Recoverable	75*	8.3*	150*	415*	No limit indicated after evaluation
Parathion	No information available		0.04			Limit not evaluated
Phenol	believed absent					(Human health standard of 4600000) Limit not evaluated
Phthalate Esters	believed absent		3.0			Limit not evaluated
Polychlorinated Biphenyls	believed absent		0.03		1.5	Limit not evaluated
Selenium	800 Total Selenium	300 *	71 *	600*	3550*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015
Silver	50 Total Recoverable	2.3*		4.6*		No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
Toxaphene	believed absent	0.21	0.0002	0.42	0.01	Data from 2C application evaluated, unless otherwise specified * The metals form is the Dissolved form Limit not evaluated
Tributyltin	(Total Tin believed absent--no TBT used onsite)					Limit not evaluated
Zinc	20 Total Recoverable	95*	86*	190*	4300*	All data less than WLA; no limit necessary

Table VII

EVALUATION OF EFFLUENT CHARACTERIZATION DATA

Outfall 005--The only data to evaluate for this new noncontact cooling water outfall is an ammonia value taken at the end of last season. The owner has assured DEQ that this outfall is identical in wastewater characteristics to the 004 noncontact cooling water. Items V and VI of Form 2C will be required within 2 years of the date of the modification of this permit.

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow 12.9MGD

PARAMETER	EFFLUENT CONCENTRATION mg/l	VIRGINIA ACUTE CRITERIA SALT WATER mg/l	VIRGINIA CHRONIC CRITERIA SALT WATER mg/l	PROJECTED IN STREAM CONCENTRATION		COMMENTS
				AVG FLOW		
				Acute (WLA _a) (2x acute standard for estuarine, per 93-015) mg/l	Chronic (WLA _c) (50x chronic standard for estuarine, per 93-015) mg/l	
Ammonia	3.41	1.05	0.16	2.1	7.9	Data from 2C application evaluated, unless otherwise specified * The metals form is the Dissolved form Av. Mo. Limit of 1.71 mg/l, Max Daily Limit of 2.1 mg/l determined

TABLE VIII
EFFLUENT LIMITATIONS
INDUSTRIAL

(x) Final Limitations
() Interim Limitations

OUTFALL 001

Dates: From the date the permit is reissued
To the date of permit expiration

SIC CODE 2077

SIC CODE 2077

PARAMETER	BASIS							EFFLUENT LIMITS			MONITORING REQUIREMENTS	
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FRE-QUENCY	SAM-PL E TYPE
BOD ₅ (kg/day)							5	1754	NA	3150	2/Month	24-HC
TSS (kg/day)							6	678	NA	930	2/Month	24-HC
Oil and Grease (kg/day)							6	403	NA	413	2/Month	Grab
pH (S.U.)							4	NA	6	9	2/Month	Grab
Temperature (degrees C)							4	NL	NA	50	1/Day	Immer sion Stabil zation
Flow (MGD)								NL	NA	NL	Continuous	Estimate
Total Phosphorus (mg/l, kg/d)							7	2.0 mg/l 245.8 kg/d	NA	NL	2/Month	24-H
Total Nitrogen (mg/l, kg/d)							7	NL	NA	NL	2/Month	24-H
Cyanide (ug/l)*							4	1.54 ug/l	NA	2.00 ug/l	2/Month	Gra

TABLE IX
EFFLUENT LIMITATIONS
INDUSTRIAL

(x) Final Limitations
() Interim Limitations

OUTFALL 002 Aerated Lagoons

Dates: From the date the permit is reissue
To the date of permit expiration

SIC CODE 2077

SIC CODE 2077

PARAMETER	BASIS						EFFLUENT LIMITS			MONITORING REQUIREMENTS		
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FREQUE NCY	SAMPLE TYPE
Flow (MGD)								NL	NA	NL	Continuou s	Measure
Temperature (degrees C)							4	NL	NA	NL	1/Day	Immersion- Stabilizati on
BOD ₅ (kg/d)							5,7,8	468	NA	839	2/Month	24-HC
Total Suspended Solids (kg/d)							6,7,8	177	NA	244	2/Month	24-HC
Oil and Grease (kg/d)							6,7,8	29.9	NA	30.7	2/Month	24-HC
Ammonia (mg/l)*							5	38.0	NA	45.3	2/Month	24-HC
pH (S.U.)							4	NA	6.0	9.0	2/Week	Grab

*Compliance Schedule Applies: see Table XII

Key

1. Per 208 Plan and Date
2. Per 303(e) Plan and Date
3. Per 401 Certification and Date
4. SWCR Water Quality Standards

5. VIMS Model
6. Reduced by same percentage as EPA multipliers reduced technology limits--See Table II for explanation
7. Must meet WQ limits when summed with 001 and 002
8. Must meet BPT limits when summed with 001, 002 and 003

TABLE X
EFFLUENT LIMITATIONS
INDUSTRIAL

(x) Final Limitations
() Interim Limitations

OUTFALL 003 Evaporator Condensate

Dates: From the date the permit is reissued
To permit expiration

SIC CODE 2077

SIC CODE 2077												
PARAMETER	BASIS							EFFLUENT LIMITS			MONITORING REQUIREMENTS	
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FRE-QUENCY	SAMF E TYPE
Flow (MGD)								NL	NA	NL	Continuous	Estimate
Temperature (degrees C)							4	NL	NA	NL	1/Day	Immer on-Stabilization
Ammonia (mg/l)*							4	39.6	NA	49.0	2/Month	24-Hr
BOD ₅ (kg/day)							4,5,6	4296	NA	7710	2/Month	24-Hr
Total Suspended Solids (kg/day)							5,6	114	NA	282	2/Month	24-Hr
Oil and Grease (kg/day)							5,6	426	NA	784	2/Month	Gravimetric

PARAMETER	BASIS							EFFLUENT LIMITS			MONITORING REQUIREMENTS	
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FRE-QUENCY	SAMPL E TYPE
Dissolved Oxygen (mg/l) (shall be reported as a daily min. value and/or daily average value should more than one sample per day be taken).							4	NL	NL	NA	1/Day	Grab
pH (S.U.)							4	NA	6.0	9.0	1/Day	Grab

*Key

1. Per 208 Plan and Date
2. Per 303(e) Plan and Date
3. Per 401 Certification and Date
4. SWCB Water Quality Standards
5. Must meet WQ limits when summed with 001 and 002
6. Must meet BPT limits when summed with 001, 002 and 003

TABLE XI
EFFLUENT LIMITATIONS
INDUSTRIAL

(x) Final Limitations
() Interim Limitations

OUTFALL 004, 005 Non-Contact Cooling Water

Dates: From the date the permit is reissued
To the date of permit expiration.

SIC CODE 2077

SIC CODE 2077												
PARAMETER	BASIS							EFFLUENT LIMITS			MONITORING REQUIREMENTS	
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FRE-QUENCY	SAM-PL E TYPE
Flow (MGD)								NL	NA	NL	Continuous	Estimate
Temperature (degrees C)							4	NL	NA	NL	1/Day	Immer-sion-Stabiliz-ation
Total Phosphorus (mg/l)							5	2.0	NA	NL	1/Quarter	24-HC
Total Nitrogen (mg/l)							5	NL	NA	NL	1/Quarter	24-HC
Ammonia mg/l							4	2.1	NA	2.1	2/Month	24-HC
pH (S.U.)							4	NA	6.0	9.0	5/Week	Grab

*Key

1. Per 208 Plan and Date
2. Per 303(e) Plan and Date
3. Per 401 Certification and Date
4. SWCB Water Quality Standards
5. SWCB Nutrient Policy

TABLE XII
EFFLUENT LIMITATIONS
INDUSTRIAL

(x) Final Limitations
() Interim Limitations

OUTFALL 006

SIC CODE 2077

Dates: From the date the CTO is issued for the
To the date of permit expiration

SIC CODE 2077												
PARAMETER	BASIS							EFFLUENT LIMITS			MONITORING REQUIREMENTS	
	EFFLUENT GUIDELINES			BEST PROFESSIONAL JUDGEMENT			WATER QUALITY*	PERMIT LIMIT				
	BPT (PROP) (PROMUL)	BAT (PROP) (PROMUL)	NSPS (PROP) (PROMUL)	BCT	BPT	BAT		AVG.	MIN	MAX.	FRE- QUENCY	SAM- PL TYPE
BOD ₅ (kg/day)							5	1754	NA	3150	3/Week	24-hr
TSS (kg/day)							6	678	NA	930	3/Week	24-hr
Oil and Grease (kg/day)							6	403	NA	413	3/Week	Gravimetric
pH (S.U.)							4	NA	6	9	2/Month	Gravimetric
Temperature (degrees C)							4	NL	NA	50	1/Day	Immersion Stabilized
Total Phosphorus							7	2.0 mg/l 245.8 kg/d	NA	NA	2/Month	24-hr
Total Nitrogen							7	NL	NA	NL	2/Month	24-hr
Flow (MGD)								NL	NA	NL	Continuous	Measurement
Cyanide (ug/l)*							4	1.54 ug/l	NA	2.00 ug/l	2/Month	Gravimetric
Ammonia (mg/l)*							4	2.1	NA	2.1	2/Month	24-hr

*Compliance Schedule Applies: see Table XIII

Key

1. Per 208 Plan and Date
2. Per 303(e) Plan and Date
3. Per 401 Certification and Date
4. SWCB Water Quality Standards
5. VIMS Model
6. Reduced by same percentage as EPA multipliers reduced technology limits--See Table II for explanation
7. Required by DEQ Nutrient Policy

Table XIII

This section is to be completed for all permits requiring a schedule of compliance.

The permittee shall achieve compliance with the final limits and monitoring requirements for ammonia-nitrogen at 001/006, 002 and 003 and cyanide at 001/006 as specified in this permit in accordance with the following schedule:

SCHEDULE OF COMPLIANCE FOR AMMONIA AND CYANIDE

1. Initiate design of facilities	Within 90 days after December 17, 1997..
2. Report of progress to DEQ	Quarterly.
3. Achieve Compliance with Effluent Limitations.	Within 4 years of December 17, 1997.

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Department's staff, either a report of progress, or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

Table XIV
VPDES PERMIT PROGRAM
Permit Processing Change Sheet

1. Effluent Limits and Monitoring Schedule: (List any changes and give a brief rationale for the change).

OUTFALL NO.	PARAMETER CHANGED	MONITORING LIMITS CHANGED		EFFLUENT LIMITS CHANGED		RATIONALE	DATE & INITIAL
		FROM	TO	FROM	TO		
001	BOD, TSS, O&G			NL-summary sheet	1754 kg/d, 678 kg/d, 403 kg/d mo. Avg respectively; 3150 kg/d, 930 kg/d, 413 kg/d Maximum, respectively	Owner requested proportioned limit instead of sum pages; Also limits have increased because Omega now has Ampro's share of the wasteload allocation in Cockrell's Creek.	8/99 DMM
001	BOD, TSS, O&G			1754 kg/d, 678 kg/d, 403 kg/d mo. Avg respectively; 3150 kg/d, 930 kg/d, 413 kg/d Maximum, respectively	1755 kg/d, 655 kg/d, 372 kg/d mo. Avg respectively; 3142 kg/d, 1609 kg/d, 685 kg/d Maximum, respectively	Limits re-examined because TSS and O&G maximums seemed too low compared to sum of values given to Ampro and Zapata in past. BOD was increased slightly to sum of both plants' loadings and TSS and O&G maximums were selected as the lesser of newly calculated values or the sum of both plants' loadings (antibacksliding consideration).	11/99 DMM
001	total phosphorus loading			12.9 kg/d	37.85 kg/d	With plant expansion, increased flow at 001	4/99 DMM
001	Ammonia-Nitrogen			1.66 mg/l avg, 1.66 mg/l max	1.68 mg/l avg, 2.0 mg/l max	new WLA40 program Loading limits taken out as per latest toxics guidance	4/99 DMM 8/99
001	Cyanide			1.63 ug/l avg/2.0 ug/l max	1.54 ug/l avg, 2.0 mg/l max	new WLA40 program; Loading limits taken out as per latest toxics guidance	4/99 DMM 8/99

OUTFALL NO.	PARAMETER CHANGED	MONITORING LIMITS CHANGED		EFFLUENT LIMITS CHANGED		RATIONALE	DATE & INITIAL
		FROM	TO	FROM	TO		
002	BOD, TSS, O&G			NL-summary sheet	468 kg/d, 177 kg/d, 29.9 kg/d mo. Avg, respectively; 839 kg/d, 244 kg/d, 30.7 kg/d max, respectively	Owner requested proportioned limit instead of sum pages; Also limits have increased because Omega now has Ampro's share of the wasteload allocation in Cockrell's Creek.	8/99 DMM
002	BOD, TSS, O&G			468 kg/d, 177 kg/d, 29.9 kg/d mo. Avg, respectively; 839 kg/d, 244 kg/d, 30.7 kg/d max, respectively	468 kg/d, 171 kg/d, 27.6 kg/d mo. Avg, respectively; 837 kg/d, 422 kg/d, 50.9 kg/d max, respectively	Limits re-examined because TSS and O&G maximums seemed too low compared to sum of values given to Ampro and Zapata in past. BOD was increased slightly to sum of both plants' loadings and TSS and O&G maximums were selected as the lesser of newly calculated values or the sum of both plants' loadings (antibacksliding consideration).	11/99 DMM
002	Ammonia-N			7.4 mg/l avg, 9.1 max	38 mg/l avg, 45 max	new diffuser study of Cockrell's Creek increased mixing dilution; Loading limits taken out per latest toxics guidance	4/99 DMM 8/99
002	Cyanide			18.7 ug/l avg/23 max	none	found not to be necessary with new dilution analysis	4/99 DMM
003	BOD, TSS, O&G			NL-summary sheet	4296 kg/d, 114 kg/d, 426 kg/d Mo.Avg., respectively; 7710 kg/d, 282 kg/d, 784 kg/d, respectively	Owner requested proportioned limit instead of sum pages; Also limits have increased because Omega now has Ampro's share of the wasteload allocation in Cockrell's Creek.	8/99 DMM

OUTFALL NO.	PARAMETER CHANGED	MONITORING LIMITS CHANGED		EFFLUENT LIMITS CHANGED		RATIONALE	DATE & INITIAL
		FROM	TO	FROM	TO		
003	Ammonia-N			2.1 mg/l avg/2.58 max	39.6 mg/l avg/49.0 max	New guidance on mixing associated with barge discharge; Loading limits taken out per latest toxics guidance	4/99 DMM 8/99
004	Total Phosphorus			115.8 kg/d avg	93.9 kg/d	flow decreased at this outfall since the new outfall added	4/99 DMM
004	Ammonia-N	none	NL			because one data point submitted from 1998 mon. season exceeded WQS—need more data to evaluate	4/99 DMM
005	flow	none	NL			new outfall	4/99 DMM
005	temperature, Total Nitrogen	none	NL			new outfall	4/99 DMM
005	Total Phosphorus			none	93.9 kg/d	new outfall	4/99 DMM
005	Ammonia-Nitrogen	none	NL			because one data point submitted from 1998 mon. season exceeded WQS—need more data to evaluate	4/99 DMM
005	pH			none	6 min/9max	new outfall	4/99 DMM
006	BOD			none	1754 kg/d avg, 3150 kg/d max	new combined outfall— from 001 limits	9/99 DMM
006	TSS			none	678 kg/d avg, 930 kg/d max	new combined outfall— from 001 limits	9/99 DMM
006	Oil and Grease			none	403 kg/d avg, 413 kg/d max	new combined outfall— from 001 limits	9/99 DMM
006	pH			none	6 min/9 max	new combined outfall— from 001 limits	9/99 DMM
006	Total Phosphorus			none	245.8 kg/d	new combined outfall— from 004/005 limits	9/99 DMM
006	Total Nitrogen	none	NL			new combined outfall— from 004/005 limits	9/99 DMM

OUTFALL NO.	PARAMETER CHANGED	MONITORING LIMITS CHANGED		EFFLUENT LIMITS CHANGED		RATIONALE	DATE & INITIAL
		FROM	TO	FROM	TO		
006	Ammonia-Nitrogen			none	1.68 mg/l avg, 2.1 mg/l max	new combined outfall--from 001	9/99 DMM
006	Cyanide			none	1.54 ug/l avg, 2 ug/l max	new combined outfall--from 001	9/99 DMM
006	temperature			none	45 degrees C	modeling calculations show combining discharge requires 45 deg. upper limit to maintain WQS (see 004/005 limit)	9/99 DMM

Additional Comments:

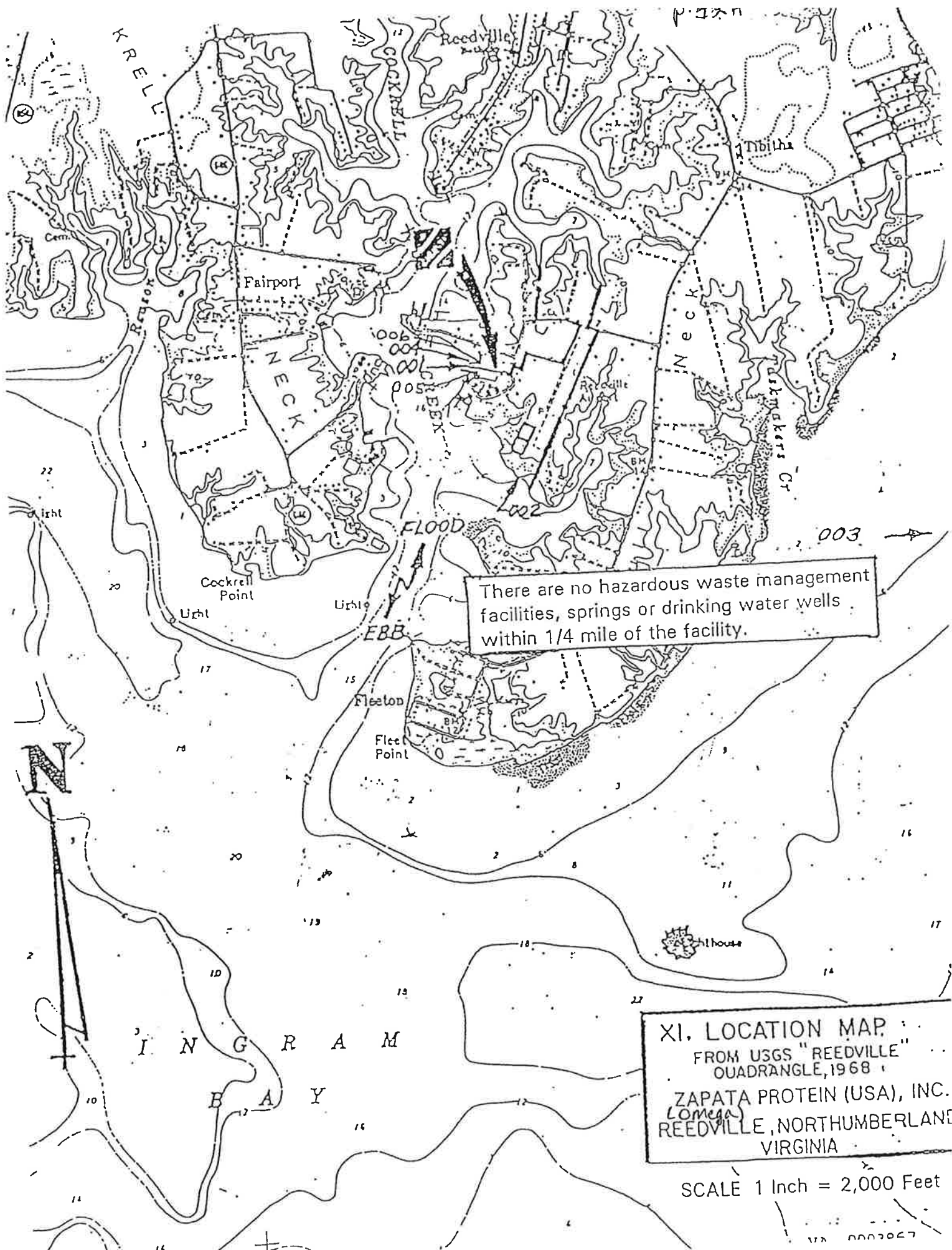
Zapata Protein bought its competitor, Ampro Fisheries, both dischargers to Cockrell's Creek. The name has changed to Omega Protein. This modification is to give them the wasteload allocation they've requested to Cockrell's Creek from the Ampro Fisheries' permit. The Ampro plant has been totally shut down now, and there is no chance of any discharge from the facility.

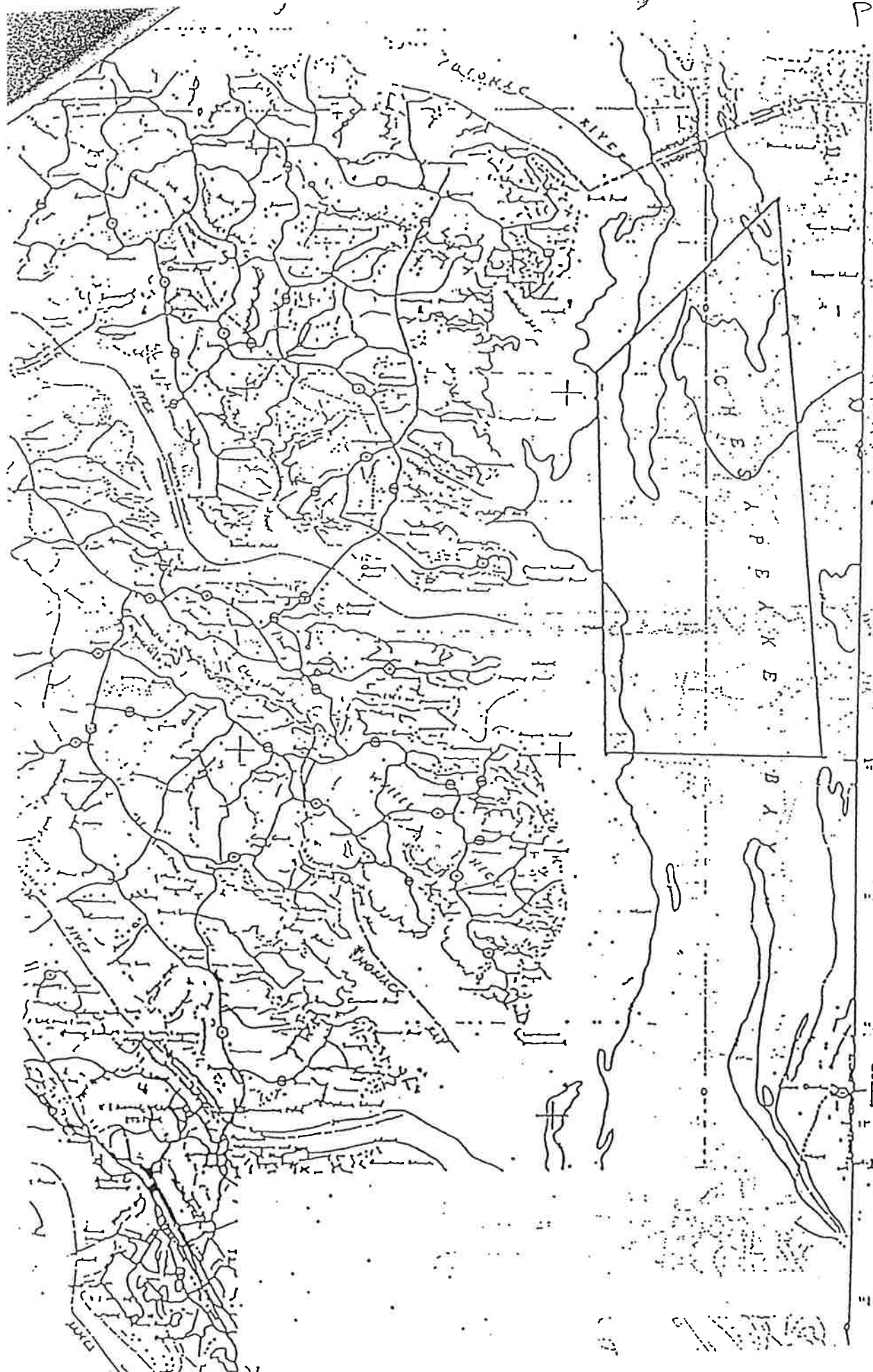
Antibacksliding review: Cockrell Creek is a tier one stream, considered fully allocated, based on the VIMS model and supporting documentation. The model was performed to model the creek for the menhaden plant limitations and showed a wasteload allocation of 5000 lb/day BOD₅. This wasteload allocation was split between the two menhaden plants on the creek at the time, and an amount (100 lb/day) was delegated to the Reedville WWTP. In accordance with Section 303(d)(4)(b), the water quality standards are being maintained in the receiving stream, and any revisions of water quality limitations are permissible if they are consistent with antidegradation policies under Section 302 (d) (4) (B). Discharge limitations for BOD₅, TSS and Oil and Grease are being revised. Also, loading limitations for Phosphorus at the non-contact cooling water outfalls (004,005). Ammonia and cyanide limitations were readjusted in accordance with new guidance and new mixing analyses of Cockrell's Creek and the barge discharge to Chesapeake Bay. However, anti-backsliding does not apply to the ammonia and cyanide limitations as they were effective on a schedule and the date of final compliance has not yet been reached.

Antidegradation Review: Two facilities (Ampro and Zapata) have been combined into one. The water quality standards in Cockrell Creek will be maintained by the conditions of this permit. The 005 discharge is new, however, anti-degradation review is not required because the stream is Tier 1 status. The Clean Water Act allows modification of the permit limits because the change complies with Section 303(d)(4)(b) and in that case Section 402 (c) does not apply.

PUBLIC NOTICE

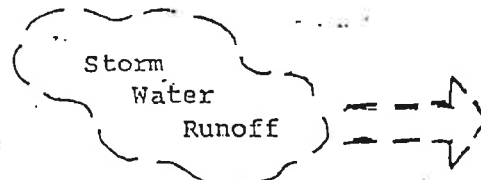
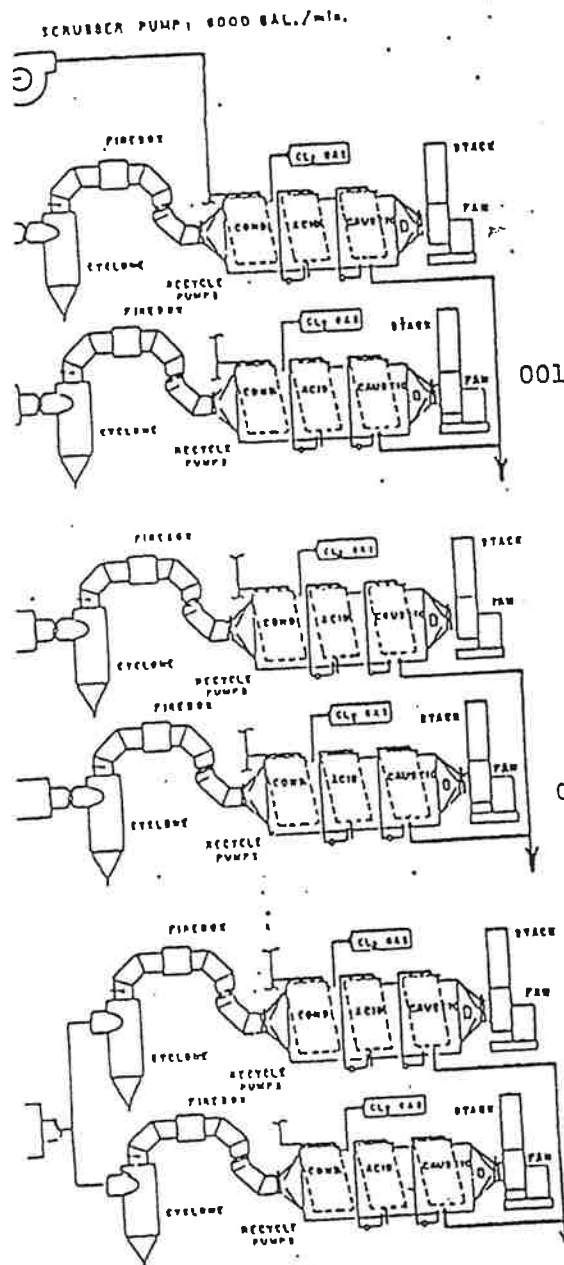
Will be completed after public notice period.





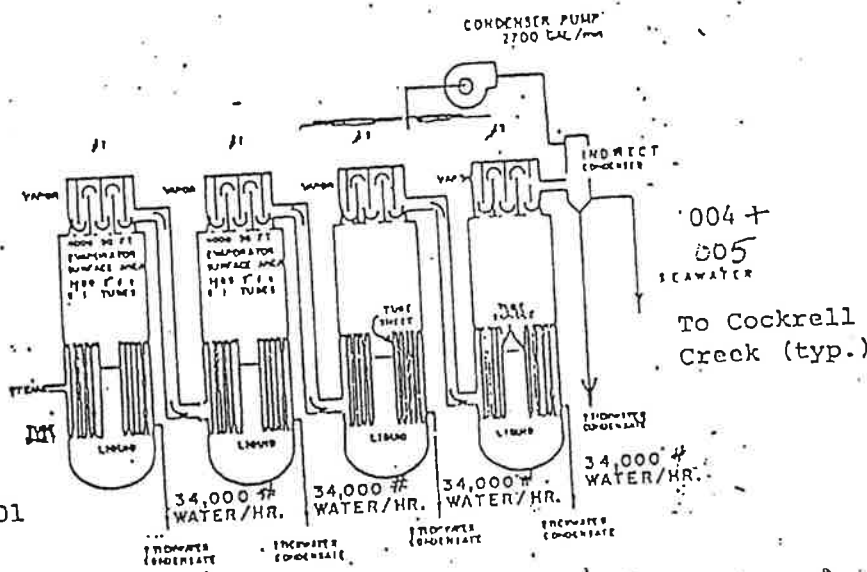
THE STATE OF NORTH CAROLINA
COUNTY OF WILMINGTON
CITY OF WILMINGTON
BOSTON
RICHMOND
NANTUCKET

NOTE: SANITARY WASTEWATER IS DISCHARGED
DIRECTLY TO SERVICE AUTHORITY.

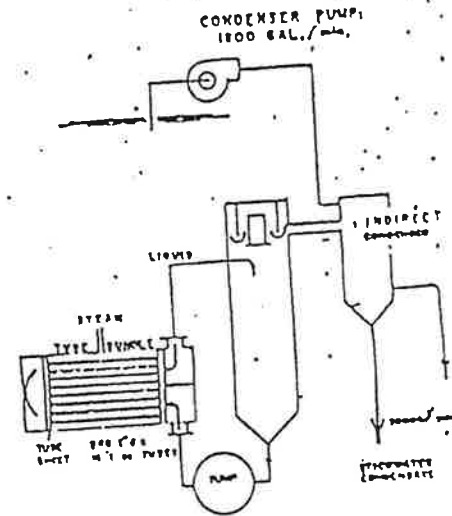


To
Cockrell Creek

Regulated by separate Stormwater General Permit



EVAPORATORS



CONCENTRATOR

001

ZAPATA HAYNIE-REEDVILLE PLANT
INDUSTRIAL WASTEWATER SOURCES

VA 0003867

NOTE: ALL CONDENSATE IS COLLECTED
PUMPED TO THE TREATMENT LA
002

SCRUBBERS

After issuance of a certificate to operate (CTO),
the plant is to be operated in accordance with the outfall location -

(except excess condensate)

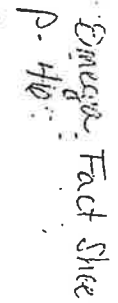
Original
Fact Sheet
P. 44

SIC CODE: 2077 (All Processes)



After issuance of a CTO, outfall 006 proposed to combine 001, 004+005 at the outfall location

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MEMORANDUM

Piedmont Regional Office, Water Division
Department of Environmental Quality
4949-A Cox Road, Glen Allen, Virginia 23060

U/REG. - Fall 2000
p. 47

SEP 16 1997

SUBJECT: Zapata Protein, Inc., Permit #VA0003867, WET limit
Special Condition

TO: Denise Mosca, KRO/DEQ

FROM: Mason Harper, PRO/DEQ *LMH*

DATE: September 10, 1997

COPIES: J.R. Bell, Jr., PRO; R. Jenkins, PRO; D. DeBiasi,
OWPS/TMP; Permit File

BACKGROUND:

The permit for the subject facility is currently in the process of reissuance. When the permit was last reissued on November 2, 1992, a Toxics Management Program (TMP) special condition was included. The TMP required quarterly acute and chronic toxicity testing using Cyprinodon variegatus and Mysidopsis bahia be performed on outfalls 001, 002, and 004. After the first two quarterly analyses were performed, effluent from outfall 002 exhibited sufficient toxicity to warrant the implementation of a Toxicity Reduction Evaluation (TRE).

The permittee was required to submit a TRE plan by May 10, 1994. That plan was reviewed and approved by DEQ staff on June 29, 1994. At that time Zapata Protein was asked to implement the TRE plan, and was allowed a three year period (until June, 1997) to complete the evaluation. The permittee was also notified that a Whole Effluent Toxicity (WET) limit would be effective upon completion of the TRE.

Zapata Protein has been actively involved in the TRE on outfall 002 since 1994. Some of the principal actions taken by Zapata Protein to reduce effluent toxicity as part of the TRE include the following:

- 1) Implemented BMPs to reduce waste loading to the treatment ponds, such as sludge removal and adjustments to the plant's evaporator equipment.
- 2) Improved waste treatment efficiency by installation of surface aeration equipment.
- 3) Performed treatability studies to investigate if nutrient addition and/or bioaugmentation will improve the nitrification of ammonia in the ponds.

By letter dated March 24, 1997, Zapata Protein requested additional time to complete improvements and treatability study

associated with the E. After considering the request, DEQ staff extended the deadline for TRE completion from June, 1997 to no later than January 15, 1998. Accordingly, in the reissued permit the Whole Effluent Toxicity (WET) limit would also become effective on January 15, 1998.

WET LIMIT DERIVATION:

The limit recommended for inclusion in the reissued permit was developed using the most recent guidance from the Office of Water Protection Services. This guidance was written in order to maintain consistency between the methods for derivation of limits for specific chemicals and for whole effluent toxicity. The guidance follows a statistical approach for WET limit development as recommended by EPA's Technical Support Document for Water Quality-Based Toxics Control.

* The acute Whole Effluent Toxicity of a minimum No Observed Adverse Effect Concentration (NOAEC) of 100% effluent was derived with the use of the attached Lotus Release 5 spreadsheet, which self calculates when the data are entered. Acute and chronic toxicity test results from the August, 1993, TMP monitoring were used to calculate an acute to chronic ratio for WET derivation. Due to the sluggish tidal mixing which occurs at the site, it is the staff's best professional judgement that the No Observed Adverse Effect Concentration (NOAEC) WET test endpoint of 100% is most protective against both acute and chronic toxicity.

Recommendations:

- 1) Please incorporate the special condition language and monitoring requirements for Whole Effluent Toxicity into the draft permit.
- 2) I recommend a permit limit for acute Whole Effluent Toxicity be a minimum No Observed Adverse Effect Concentration (NOAEC) of 100% effluent. The test organism shall be Mysidopsis bahia. Sample frequency should be quarterly (when plant is operational) and sample type should be 24 hour composite.

Spreadsheet for determination of WET test endpoints or WET limits

Lotus Release 5 - Developed by OWPS-TMP
Revision Date: 01/02/97
File: TMP-WET5.wk4 (MIX.EXE required also)

ENDPOINTS / LIMITS		
ACUTE	100% =	NOAEC
CHRONIC	1.728 TUc	
BOTH*	6.9768 TUc	

*In cases where the ACR is derived from actual data, the combined limit expressed as TUc may be sufficient to protect for both acute and chronic toxicity.

Enter data in the cells with blue type:

Entry Date: 09/05/97
Facility Name: Zapata Haynie Corp.
VPDES Number: VA0003867
Outfall Number: 2

Plant Flow: 0.2 MGD
Acute 1Q10: NA MGD
Chronic 7Q10: NA MGD

% Flow to be used from MIX.EXE

100 %
100 %

Difuser / modeling study?

Enter Y/N N
Acute 1 : 1
Chronic 50 : 1

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, which use the same organism, tested at the same temperature.

Table 1. ACR using Vertebrate data

Set#	LC50	NOEC	Test ACR	Logarithm	Geomean	Antilog ACR to Use	
1	35.4	1	35.4	3.56671182	3.56671	35.4	35.4
2	NA	NA	NA	NA	NA	NA	NA
3	NA	NA	NA	NA	NA	NA	NA
4	NA	NA	NA	NA	NA	NA	NA
5	NA	NA	NA	NA	NA	NA	NA
6	NA	NA	NA	NA	NA	NA	NA
7	NA	NA	NA	NA	NA	NA	NA
8	NA	NA	NA	NA	NA	NA	NA
9	NA	NA	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA	NA	NA

Enter ACR for vertebrate data:

0

Table 2. ACR using Invertebrate data

Set#	LC50	NOEC	Test ACR	Logarithm	Geomean	Antilog ACR to Use
1	17	1	17	2.833213	2.833213	17
2	NA	NA	ERR	ERR	ERR	ERR
3	NA	NA	ERR	ERR	ERR	ERR
4	NA	NA	NA	NA	ERR	ERR
5	NA	NA	NA	NA	ERR	ERR
6	NA	NA	NA	NA	ERR	ERR
7	NA	NA	NA	NA	ERR	ERR
8	NA	NA	NA	NA	ERR	ERR
9	NA	NA	NA	NA	ERR	ERR
10	NA	NA	NA	NA	ERR	ERR

Enter ACR for invertebrate data:

17

IWCa 100 % Plant flow/plant flow + 1Q10
IWCc 100 % Plant flow/plant flow + 7Q10

NOTE: If the IWCa is >33%, use the test NOAEC = 100%

Dilution, acute 1 100/IWCa
Dilution, chronic 1 100/IWCc

WLAa 0.3 Instream criterion (0.3 TUa) X's Dilution, acute
WLAc 1 Instream criterion (1.0 TUc) X's Dilution, chronic
WLAa,c 5.1 ACR X's WLAa - converts acute WLA to chronic units

ACR -acute/chronic ratio 17 LC50/NOEC (Default is 10 - if data is available, use tables above)
CV-Coefficient of variation 0.6 Default of 0.6
Constants eA 0.57 Default = 0.57
eB 0.72 Default = 0.72
eC 2.4 Default = 2.4

LTAa,c 2.907 WLAa,c X's eA
LTAc 0.72 WLAc X's eB
MDL** with LTAa,c 6.9768 TUc NOEC = 14.3332 (Protects from acute/chronic toxicity)
MDL** with LTAc 1.728 TUc NOEC = 57.8704 (Protects from chronic toxicity)

** The Maximum Daily Limit is calculated the lowest Long Term Average, multiple the constant eC. The LTAa,c and the M using it are driven by the ACR.

IF A DIFUSER EXISTS, THE MIX RATIO IS USED IN THE CALCULATION BELOW:

Dilution, acute: 1 (if the acute dilution is 20:1, 20 should be here)
Dilution, chronic: 50 (if the chronic dilution is 25:1, 25 should be here)

IWCa: 100 % 100/acute dilution
IWCc: 2 % 100/chronic dilution

WLAa 0.3 TUa Instream criterion (0.3 TUa) X's Dilution, acute
WLAc 50 TUc Instream criterion (1.0 TUc) X's Dilution, chronic
WLAa,c 5.1 TUc ACR X's WLAa

ACR (ac/chr ratio) 17 LC50/NOEC - Default = 10
Coeff. of variation 0.6 Default is 0.6
Constants: eA 0.57 Default is 0.57
eB 0.72 Default is 0.72
eC 2.4 Default is 2.4

LTAa,c 2.907 TUc WLAa,c X's eA
LTAc 36 TUc WLAc X's eB
MDL** with LTAa,c 6.9768 TUc NOEC = 14.3332
MDL** with LTAc 86.4 TUc NOEC = 1.157407

IF ONLY ACUTE ENDPOINT / LIMIT IS NEEDED, CONVERT MDL FROM TUc to TUa

IF ONLY ACUTE ENDPOINT / LIMIT IS NEEDED, CONVERT MDL FROM TUc to TUa

MDL with LTAa,c 0.4104 TUa LC50 = 243.665 % Use NOAEC=100%
MDL with LTAc 0.101647 TUa LC50 = 983.796 % Use NOAEC=100%

MDL with LTAa,c 0.4104 TUa LC50 = 243.6647 Use NOAEC=100%
MDL with LTAc 5.082353 TUa LC50 = 19.67593

0.4104
19.67593

1. Whole Effluent Toxicity Effluent Limitation and Monitoring Requirements (Acute WET Limit)

- a. The Whole Effluent Toxicity limit for outfall 002 shall be a minimum No Observed Adverse Effect Concentration (NOAEC) of 100% effluent. This is a final limit with an effective date of January 15, 1998.
- b. Commencing within 3 months of the effective date established in a. above, the permittee shall conduct quarterly acute toxicity tests using 24 hour flow-proportioned composite samples of final effluent from outfall 002. The acute toxicity tests shall be 48-hour static tests using Mysidopsis bahia, and shall be conducted using a minimum of 20 test organisms per exposure and a minimum of 4 replicates of a suitable control and 100% effluent. The No Observed Adverse Effect Concentration shall be reported on the DMR for the month following the quarter in which the test is performed. Report either 100% or less than 100%. Two copies of a detailed report concerning the conduct of the test shall accompany the results. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality, if requested by the permittee. Test protocols shall be submitted for approval no later than two months before the effective date of the limit.
- c. The No Observed Adverse Effect Concentration (NOAEC) for acute toxicity shall be 100% effluent. The effluent will comply with the WET limit if the survival of test organisms in both the control and 100% effluent exposures equals or exceeds 90%. If survival in the effluent is less than 90% and this value is significantly different from the control survival, as determined by hypothesis testing, the NOAEC is less than 100% and the effluent is not in compliance with the WET limit. Tests in which control survival is less than 90% are not acceptable.
- d. In the event that quarterly WET testing as in b. above is not possible due to lack of operations at the facility, the permittee shall notify the Department of Environmental Quality's Kilmarnock Regional Office with the DMR submitted for the month following the quarter in which the test was to have been performed.
- e. This permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a

WET limit should it be demonstrated that toxicity
is due to specific parameters. The pollutant
specific limits must control the toxicity of the
effluent.

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M E M O R A N D U M

Piedmont Regional Office, Water Division
Department of Environmental Quality
4949-A Cox Road, Glen Allen, Virginia 23060

SUBJECT: Toxicity Test Data Review and Toxics Monitoring
Program, Zapata Protein, Inc., Permit #VA0003867

TO: Denise Mosca, KRO/DEQ

FROM: Mason Harper, PRO/DEQ JMH

DATE: September 10, 1997

COPIES: D. DeBiasi, OWPS/TMP, Permit File

GENERAL:

Zapata Protein, Inc., is a fish processing factory located in Reedville, Virginia. Menhaden are caught by boats in the Chesapeake Bay and Atlantic, brought to the plant, and cooked to render fish oil and fish meal. These products are then sold for use in animal feed and several other applications. The operations are seasonal depending on the availability of menhaden, and generally run between May and November.

There are currently three outfalls in use which are permitted by VPDES permit #VA0003867. All three outfalls discharge to Cockrells Creek. Outfall 001 consists of scrubber contact cooling water and discharges up to 3.4 MGD. Outfall 002 discharges 0.2 MGD of treated industrial wastewater (condensate from evaporators). The effluent is treated by aerated lagoon prior to discharge. Outfall 004 consists entirely of non-contact cooling water (9 MGD) from the evaporators. A fourth outfall is permitted (003) but has not been used since 1989.

The permit for this facility was reissued on November 2, 1992, and included a Toxics Management Program (TMP) special condition. The TMP required quarterly acute and chronic toxicity testing using Cyprinodon variegatus and Mysidopsis bahia be performed on outfalls 001, 002, and 004. Concurrent chemical analyses were also required.

DATA SUMMARY:

This data review includes the results of the third and fourth sets of quarterly biological analyses on outfall 001 and 004. The first and second set of tests for these two outfalls were reviewed in past reports. Those results are included in the tables below. In addition, one make up test (for previously invalidated test) and two annual tests for outfall 001 were reviewed. The facility has been conducting a Toxicity Reduction Evaluation (TRE) on outfall 002 since the summer of 1994, and was exempted from further TMP testing pending completion of the TRE.

See Tables 1. through 5. below for a summary of test results on the two outfalls. All tests reviewed for this report were performed by Biological Monitoring, Inc., of Blacksburg, Virginia, and were conducted in accordance with approved protocol.

DISCUSSION/CONCLUSIONS:

Test results from outfall 001 indicate that this effluent was not acutely toxic to either indicator organism. All ten of the valid acute tests conducted to date have yielded LC50 values greater than 100% effluent concentration. In addition, survival in the undiluted effluent ranged between 85% and 100% in all acute tests, indicating no dose response of either indicator organism occurred to the effluent on any sample.

Effluent from outfall 001 did adversely affect survival, reproduction and/or growth of the indicator organisms in eight of the total of ten chronic tests. Because the Instream Waste Concentration (IWC) of this discharge is 2%, chronic toxicity instream would only be predicted to have occurred in the July, 1993 test with M. bahia.

Test results from outfall 004 indicate that this effluent was not acutely toxic to either indicator organism. Eight of the required total of eight tests have yielded LC50 values greater than 100% effluent concentration. Survival in the undiluted effluent ranged between 95% and 100%.

Chronic test results from outfall 004 yielded NOEC values (no adverse affect) equal to 100% effluent in five of the total of eight chronic tests conducted. Because the NOEC values in the remaining three tests were equal or greater than the IWC of 2%, chronic toxicity would not be predicted.

RECOMMENDATIONS:

Both outfalls 001 and 004 have successfully met the decision criteria for acute and chronic toxicity as defined in the TMP permit special condition. According to the TMP in the current permit, if outfall 004 passes the decision criteria after the initial four quarters testing, then no further testing will be required.

When the permit for this facility is next reissued, a TMP special condition should be included. Outfall 004 will be exempted from further TMP monitoring because it consists entirely of non-contact cooling water and has passed the initial four quarters screening. Annual acute and chronic toxicity tests should continue to be performed on outfall 001 during the next permit cycle. I recommend the organism Cyprinodon variegatus for use in both the acute and chronic testing.

I have included special biological monitoring conditions in the draft TMP for outfall 003. This outfall will continue to be permitted in the upcoming permit, and will give the permittee the option of transporting untreated process wastewater to a

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designated zone in the Chesapeake Bay. The effluent which would be transported is identical to that which is currently treated in aerated lagoons and discharged via outfall 002. Because outfall 002 (treated industrial wastewater) has demonstrated acute toxicity and is currently in TRE, one may infer that the untreated wastewater could be toxic also. In the draft TMP I recommend that toxicity tests be conducted on the first four discharges which may occur via this outfall. If the results of those tests indicate actual or potential toxicity, then further discharges would be prohibited until toxicity reduction (TRE/Instream Impact Study) has been demonstrated.

Please incorporate the attached TMP into the draft permit.

TOXICITY TEST RESULTS

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Table 1. Acute toxicity test results from effluent collected at outfall 001.

Date	Test Organism	Results	% Survival in	
			100%	Effluent
Jul. 14, 1993*	<u>C. variegatus</u>	LC50 > 100%	NA	
Jul. 14, 1993*	<u>M. bahia</u>	LC50 > 100%	NA	
Aug. 15, 1993*	<u>C. variegatus</u>	LC50 > 100%	NA	
Aug. 15, 1993*	<u>M. bahia</u>	LC50 > 100%	NA	
June 25, 1994	<u>C. variegatus</u>	LC50 > 100%	100%	
June 25, 1994	<u>M. bahia</u>	LC50 > 100%	100%	
Aug. 30, 1994	<u>C. variegatus</u>	LC50 > 100%	100%	
Aug. 30, 1994	<u>M. bahia</u>	LC50 > 100%	100%	
June 20, 1995	<u>M. bahia</u>	LC50 > 100%	100%	
July 24, 1996	<u>M. bahia</u>	LC50 > 100%	85%	

Table 2. Chronic toxicity test results from effluent collected at outfall 001.

Date	Test Organism	Results	% Survival in	
			100%	Effluent
Jul. 8, 1993*	<u>C. variegatus</u>	NOEC = 0%	NA	
Jul. 8, 1993*	<u>M. bahia</u>	Invalid	NA	
Aug. 8, 1993*	<u>C. variegatus</u>	NOEC = 51%	NA	
Aug. 8, 1993*	<u>M. bahia</u>	NOEC = 51%	NA	
June 22, 1994	<u>C. variegatus</u>	NOEC = 2%	70%	
June 22, 1994	<u>M. bahia</u>	NOEC = 100%	95%	
Aug. 24, 1994	<u>C. variegatus</u>	NOEC = 100%	90%	
Aug. 24, 1994	<u>M. bahia</u>	NOEC = 2%	25%	
Oct. 5, 1994	<u>M. bahia</u>	NOEC = 100%	97%	
June 20, 1995	<u>C. variegatus</u>	NOEC = 51%	5%	
Aug. 7, 1996	<u>C. variegatus</u>	NOEC = 51%	0%	

Table 3. Acute toxicity test results from effluent collected at outfall 004.

Date	Test Organism	Results	% Survival in	
			100%	Effluent
Jul. 14, 1993*	<u>C. variegatus</u>	LC50 > 100%	NA	
Jul. 14, 1993*	<u>M. bahia</u>	LC50 > 100%	NA	
Aug. 15, 1993*	<u>C. variegatus</u>	LC50 > 100%	NA	
Aug. 15, 1993*	<u>M. bahia</u>	LC50 > 100%	NA	
June 25, 1994	<u>C. variegatus</u>	LC50 > 100%	100%	
June 25, 1994	<u>M. bahia</u>	LC50 > 100%	100%	
Aug. 30, 1994	<u>C. variegatus</u>	LC50 > 100%	100%	
Aug. 30, 1994	<u>M. bahia</u>	LC50 > 100%	95%	

Table 4. Chronic toxicity test results from effluent collected at outfall 004.

Date	Test Organism	Results	% Survival in	
			100%	Effluent
Jul. 8, 1993*	<u>C. variegatus</u>	NOEC = 100%	NA	
Jul. 8, 1993*	<u>M. bahia</u>	NOEC = 100%	NA	
Aug. 8, 1993*	<u>C. variegatus</u>	NOEC = 51%	NA	
Aug. 8, 1993*	<u>M. bahia</u>	NOEC = 2%	NA	
June 22, 1994	<u>C. variegatus</u>	NOEC = 2% (grth.)	80%	
June 22, 1994	<u>M. bahia</u>	NOEC = 100%	100%	
Aug. 24, 1994	<u>C. variegatus</u>	NOEC = 100%	80%	
Aug. 24, 1994	<u>M. bahia</u>	NOEC = 100%	98%	

*Previously reviewed toxicity tests.

1. Toxics Management Program

a. Biological Monitoring (outfall 003):

- (1) If the permittee elects to discharge effluent (evaporator condensate only) via outfall 003, then the following testing will be required for each discharge event until the first four discharge events have occurred:

Two acute toxicity tests using grab samples of final effluent from outfall 003. The acute tests shall be 48-hour static tests using Cyprinodon variegatus and Mysidopsis bahia, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC₅₀.

- (2) The following criterion shall be used in evaluating the toxicity test data generated in (1) above:

LC₅₀ greater than or equal to 100% effluent concentration in six of the total of eight acute toxicity tests

- (3) If effluent from outfall 003 fails the above criterion it shall be considered to have demonstrated actual or potential toxicity. Accordingly, continued discharge of this effluent via outfall 003 shall be prohibited. In order to resume discharging from this outfall the permittee must:

- (a) assure the absence of actual or potential toxicity, or
- (b) demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.

b. Biological Monitoring (outfall 001):

- (1) In accordance with the schedule in d. below and commencing within three months of the effective date of this permit and continuing for the duration of the permit, the permittee shall conduct annual acute and chronic toxicity tests using 24-hour flow-proportioned samples of final effluent from outfall 001. The acute tests shall be 48-hour static tests using Cyprinodon variegatus, conducted in such a manner and at sufficient dilutions for

calculation of a valid LC_{50} . The chronic shall be static renewal tests using Cyprinodon variegatus. The C. variegatus test shall be a 7-day larval survival and growth test. These chronic tests shall be conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and growth. The permittee may provide additional samples to address data variability. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and the use of alternative species shall be approved by the Department of Environmental Quality staff prior to initiation of testing.

(2) In the event that annual testing (1) above or quarterly testing as in (4) below is not possible due to lack of operations at the facility, the permittee shall notify the Department of Environmental Quality's Kilmarnock Regional Office with the DMR submitted for the month following the quarter in which the tests were to have been performed. In such cases, the schedule shall be adjusted ahead by one quarter. In the event that the plant is not in operation for two or more consecutive quarters, the procedures for notification of the regional office and schedule adjustments shall be repeated for each quarter in which the plant is not in operation.

(3) If, in the testing according to b.(1) above, any of the annual acute toxicity tests yields an LC_{50} of less than 100% effluent, or any of the annual chronic tests yields an NOEC of less than the IWC of 2%, the test shall be repeated within three months.

(a) If the retest also indicates an LC_{50} of less than 100% effluent or an NOEC less than the IWC, quarterly toxicity testing as in b.(4) below shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction.

(b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

(4) If required in b.(3)(a) above, the permittee shall conduct quarterly acute and chronic toxicity tests for a period of one year using 24-hour flow-proportioned samples of final effluent from outfall 001. The acute tests shall be 48-hour static tests using Mysidopsis bahia and Cyprinodon variegatus, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC₅₀. The chronic tests shall be static renewal tests using M. bahia and C. variegatus. The M. bahia test shall be a 7-day larval survival, growth and/or fecundity test, and the C. variegatus test shall be a 7-day larval survival and growth test. These chronic tests shall be conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction or growth. The permittee may provide additional samples to address data variability during the one year period of initial data generation. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and the use of alternative species shall be approved by the Department of Environmental Quality staff prior to initiation of testing.

(5) The following criteria shall be used in evaluating the toxicity test data generated in (4) above:

(a) LC₅₀ greater than or equal to 100% effluent in six of the total of eight acute toxicity tests, or in at least 75% of the tests conducted, if more than eight tests are conducted.

(b) No Observed Effect Concentration (NOEC) greater than or equal to the Instream Waste Concentration (IWC) of 2%, in six of the total of eight toxicity tests, or in at least 75% of the tests if more than eight tests are conducted.

Any effluent failing either of the above criteria shall be considered to have demonstrated actual or potential toxicity and a Toxicity Reduction Evaluation (TRE) will be required.

(6) If, prior to completing the monitoring requirements specified in b.(4) above, it is determined that the

effluent fails the decision criteria outlined in b.(5), a TRE may be required. Upon notification by the Department of Environmental Quality that a TRE is required, the permittee shall initiate a TRE and may stop conducting the toxicity tests of b.(4).

- (7) Following successful completion of the testing of outfall 001 as in (5)(a) and (b) above, the permittee shall resume annual acute and chronic toxicity testing of the outfall. The first annual tests shall be conducted within three months from the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests, or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a TRE of the outfall has been established.
- (8) If, in the testing according to b.(7) above, any of the annual acute toxicity tests yields an LC_{50} of less than 100% effluent, or any of the annual chronic tests yields an NOEC less than the IWC of 2%, the test shall be repeated within three months.
 - (a) If the retest also indicates an LC_{50} of less than 100% effluent or an NOEC less than the IWC, quarterly toxicity testing as in b.(4) above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction.
 - (b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

b. Toxicity Reduction Evaluation (outfall 001):

- (1) If the results of this Toxics Management Program or other available information indicate that the wastewaters are actually or potentially toxic, the permittee shall submit:
 - (a) a Toxicity Reduction Evaluation (TRE) plan, or
 - (b) at the permittee's option, an instream impact study plan, and
 - (c) an accompanying implementation schedule

within 120 days of the notification of such a determination by the Department of Environmental

Quality:

- (2) The requirement of this plan shall be to:
 - (a) assure the absence of actual or potential toxicity, or
 - (b) to demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.
- (3) Upon completion of the review of the plan, the permittee shall implement the plan and the permit may be modified or alternatively revoked and reissued in order to reflect appropriate permit conditions and a compliance schedule.

d. Reporting Schedule:

The permittee shall submit 2 copies of the results of the toxicity tests specified for outfall 001 in this Toxics Management Program in accordance with the following schedule:

(1)	Submit toxicity test protocols for approval	Within two months following the effective date of the permit
(2)	Conduct first annual biological tests	Within three months following the effective date of the permit
(3)	Submit results of d.(2)	With the Discharge Monitoring Report (DMR) for the fourth month following the effective date of the permit
(4)	Conduct subsequent annual biological tests	Within subsequent twelve month periods from d.(2)
(5)	Submit results of d.(4)	With the DMRs submitted every twelve months from d.(3)

Omega Fact Inter
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Denise M. Mosca@KLMCK@DEQ

From: Jody L. Bryan@RCHMD@DEQ
Subject: Omega Protein
Date: Thursday, August 13, 1998 14:32:06 EDT
Attach:
Certify: Y
Forwarded by:

looked at the toxicity test results. No need to change TMP requirements at this time.

See ya later...gotta hustle!

max. flows
realistic temps
(from DMRS)

Omega Temp Std - Cooling Water Flows

001 = contact cooling water max flow 7.17 MGD

004+005 = noncontact cooling water max flows 12.4, 12.9 MGD
total Qd = 32.47

from DMRS -

	5/98	6/98	7/98	8/98
001 avg	27.7	32.7	37.3	35.3
max	30	39	42	40.0

use 45° for both Cd

004 avg	28.9	30.4	36.3	34.7
max	34	37	43	39

Cs = 90th percentile 25

$$C_m = \frac{Q_s C_s + Q_d C_d}{Q_s + Q_d}$$

$$= \frac{(288.34)(28.5) + (32.47)(45)}{288.34 + 32.47}$$

$$= 30.17 < 31.5 \text{ OK}$$

288.34 MGD use C
flow of Cackrell
Creek, from 1992 F
Fact Sheet

at low temps, say, 8°C

	10/97	11/97
001	35.0	27.0
004	31.0	24.0

use
12/97
26.0
22.0

$$C_{m_{004/005}} = \frac{288.34(8^\circ) + (25.3)(22^\circ)}{288.34 + 25.3} = 9.13$$

$$C_{m_{001}} = \frac{(288.34 + 25.3)(9.13) + (7.17)(26.0)}{(288.34 + 25.3) + 7.17}$$

$$= 9.51^\circ\text{C} < 11^\circ\text{C} \text{ OK}$$

Original only
p. 64

Jon VanSoestbergen@RCHMD@DEQ

cc:
from: Maynard D. Phillips@WPS@DEQ
subject: Monday, September 28, 1998 8:45:07 EDT
re:
attach:
certify: N
forwarded by: Jon VanSoestbergen@RCHMD@DEQ

forwarded to: Denise M. Mosca@KLMCK@DEQ
cc: Maynard D. Phillips@WPS@DEQ
forwarded date: Monday, September 28, 1998 10:23:12 EDT
comments by: Jon VanSoestbergen@RCHMD@DEQ
comments:

Denise:

Following are Dale's comments regarding my 9/17/1998 memo and work on the Zapata wasteload allocation review and CORMIX analysis. If you include this e-mail as part of the file I don't see any reason to rewrite my 9/17/1998 memo. Could you please make a copy of the 9/17/1998 memo and attachment (24 pages) and send it to me. I forgot to make a copy before I gave you the package when you were here last week.

To address Dale's comments/questions:

Dale's explanation as to why the long diffuser is better should be adequate documentation regarding this issue.

The circular mixing zone I describe in my 9/17/1998 is as measured from the midpoint of the diffuser. CORMIX defines the origin of the coordinate (x-y-z) plane as this point. S (the hydrodynamic centerline dilution) is then as measured from this origin. Therefore, I believe my definition of the mixing zone as a circle measured around the diffuser midpoint is not incorrect. However, describing the mixing zone as extending from the diffuser in any direction is also acceptable, and would have the effect only of extending the boundary slightly further out in the y-direction toward the middle of the stream, in theory resulting in a slightly larger mixing zone. Practically, though, the difference between the two is of the order of 10 feet in the y-direction, which in the context of water quality monitoring and model accuracy is negligible. In any event, the final defined mixing zone will be a function of the final diffuser design submitted by Zapata. You should provide this final design to me for analysis when it is received, unless some sort of mixing zone analysis is provided as documentation with the design.

I will consider this e-mail as finalizing my 9/17/1998 memorandum and my work on this project. If you have any questions or need additional information, please don't hesitate to call me.

Jon.

9-17-98
p.65

o: Maynard D. Phillips@WPS@DEQ
c: Denise M. Mosca@KLMCK@DEQ
Curtis J. Linderman@RCHMD@DEQ
From: Jon VanSoestbergen@RCHMD@DEQ
subject: Zapata CORMIX analysis
date: Thursday, September 17, 1998 9:34:00 EDT
attach:
certify: N
forwarded by:

Date:

I am sending you the results of the CORMIX analysis I did for Zapata today. I have not yet sent the information to Denise pending your review. Please let me know if you have any concerns with the analysis. I will wait to send the package to Denise until I hear from you one way or the other.

In summary, I ended up analyzing two different diffuser designs. The first approximates the design that was included in the package provided by Denise, and the second is a design of my own. The first ("short diffuser") results in a dilution ratio of 50:1. The second ("long diffuser") results in a dilution ratio of 100:1. The mixing zone for the first is 25 feet, for the second, 20 feet. The ratio used by the permit writer will depend on the final diffuser design selected by the permittee.

As we discussed yesterday, I analyzed each design 1 hr before slack tide, at slack tide, and 1 hr after slack tide. Then I averaged the most conservative two results for each diffuser to obtain the final dilution ratio. This results in a dilution ratio based on a 1-hr average flow under critical conditions, which best reflects the way the acute standard is written. My recommendation is that the selected dilution ratio be used for both acute and chronic WLA determination.

Thanks for your help on this.

Jon.

p. 66

MEMORANDUM


DEPARTMENT OF ENVIRONMENTAL QUALITY *Piedmont Water Regional Office*

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

SUBJECT: Cockrell's Creek Wasteload Allocations and Dilution Analysis
Zapata Protein (USA), Inc. Discharge (VA0003867)

TO: Denise Mosca

FROM: Jon van Soestbergen 

DATE: September 17, 1998

COPIES: Dale Phillips, Curt Linderman

Per your request, I have reviewed the BOD wasteload allocations for the subject discharge to Cockrell's Creek. I also constructed a CORMIX model to analyze dilution ratios at the discharge associated with different diffuser designs. Two discharges (Ampro Fisheries and Zapata Protein) previously competed for the available assimilative capacity of the receiving stream, and previous models and analyses simulated both discharges to allocate wasteloads. However, the Ampro discharge was terminated. The purpose of this review was to determine if the BOD wasteload previously allocated to Ampro was available in part, or in total, to Zapata. The CORMIX analysis of a diffuser for outfall number 002 was performed to determine the dilution ratio for establishing wasteload allocations for conservative parameters.

BOD Wasteload Allocation Review

In September 1976, the Virginia Institute of Marine Sciences (VIMS) completed a mathematical water quality study of the Great Wicomico River and Cockrell's Creek. The model determined that an average of 5,000 lbs/day of BOD₅ would maintain water quality standards in the upper layer of the creek, which was the only layer used to determine the pollutant loading to the creek. Of this total, 4,900 lbs/day would be allocated to Ampro (then known as Standard Products) and Zapata.

My review of the available information leads me to conclude that the total allowable loading to Cockrell's Creek is 5,000 lbs/day of BOD₅, regardless of the point of discharge. Therefore, with the termination of the Ampro discharge, the entire 4,900 lbs/day previously allocated to the two discharges is available for allocation to Zapata.

CORMIX Diffuser Analysis

Zapata currently proposes to discharge through a total of four outfalls to Cockrell's Creek, but only outfall 002 was considered for a diffuser. The proposed discharge flow from this outfall is 0.300 mgd. The complex design of the diffuser included with the permit fact sheet can not be accurately analyzed using the CORMIX model. However, by simplifying the design somewhat, the expected dilution the diffuser will provide could be estimated. In addition to analyzing the design of this diffuser, a modified design was analyzed which affords better dilution in the near field.

Two diffuser designs were analyzed; one which closely approximates the design included in the fact sheet ("short diffuser") and one which affords better dilution ("long diffuser"). For each case, dilution was analyzed relative to one-hour averages under critical conditions, which most closely approximates the way the acute standards are written.

Cockrell's Creek Wasteload Allocations and Dilution Analysis
Page 2

"Short Diffuser" - This diffuser design consists of a 12-inch diameter pipe extending 35 feet perpendicular to the east bank of the creek into water of approximately 5 foot depth. The diffuser line (the part with holes) starts 15 feet from the shore and extends to the end of the diffuser (20 feet). There are 13 holes of 4 inch diameter in the top of the pipe, and the end is blocked such that all flow is directed upward through the diffuser ports (holes). A rough sketch of the diffuser is attached.

This "short diffuser" design results in a dilution of 50:1 at the boundary of the mixing zone. This dilution ratio should be used to determine both acute and chronic WLAs for the discharge. The associated mixing zone boundary is 7.62 meters (25 feet) measured in a circle from the diffuser midpoint.

"Long Diffuser" - This diffuser consists of a 12-inch diameter pipe extending 60 feet perpendicular to the east bank of the creek, also into water of approximately 5 foot depth. The diffuser line starts 20 feet from shore and extends to the end of the diffuser (40 feet). There are 8 holes of 4 inch diameter, located such that flow will be directed in a 45 degree angle toward the water surface in the downstream direction during ebb tide. Again, the end of the pipe is closed so that all flow discharges through the diffuser ports. A rough sketch of the diffuser is attached.

This "long diffuser" design results in a dilution of 100:1 at the boundary of the mixing zone. This dilution should be used for both the acute and chronic WLAs for the discharge. The associated mixing zone boundary is 6.10 meters (20 feet) measured in a circle from the diffuser midpoint.

Conclusions and Recommendation

The BOD₅ wasteload available to Zapata Protein is 4,900 lbs/day.

If the "short diffuser" is specified, a dilution ratio of 50:1 should be used. For the "long diffuser", the dilution ratio can be increased to 100:1. This shows that different diffuser designs can result in dramatically different dilution ratios, and thus need to be taken into consideration when establishing wasteload allocations and permit limits. As such, it is important that the diffuser design be specified for a wasteload allocation based on a given dilution ratio. It is recommended that the alternate diffuser designs be presented to the permittee so that the advantages of each design can be considered. The designs presented should serve only as preliminary designs. The sketches provided herewith should in no way be construed as final diffuser designs. Alternate designs not yet considered are also possible, and can be submitted by the permittee for subsequent analysis using CORMIX.

Pertinent documentation for the CORMIX analysis is included herewith. Should you have any questions or need additional information, please do not hesitate to contact me.

Attachment:

Notes and Model Runs - Zapata Cormix Diffuser Analysis - Cockrell's Creek, 09/16/1998, 24 pages

ZAPATA CORMIX DIFFUSER ANALYSIS - COCKRELL'S CREEK

9.16.98

VA DEQ - PRD J. VAN SOESTBERGEN

MODEL RUN SUMMARIES.

6 SEPARATE SCENARIOS WERE RUN TO OBTAIN AVERAGE DILUTION RATIOS RELATIVE TO THE ACUTE STANDARD FOR TWO DIFFERENT DIFFUSER DESIGNS. THREE SCENARIOS WERE NECESSARY FOR EACH DESIGN: AFTER-SLACK (FLOW UP THE CREEK), SLACK (NO AMBIENT FLOW), AND BEFORE-SLACK (FLOW DOWN THE CREEK).

TWO DIFFUSER DESIGNS WERE SIMULATED; SHORT DIFFUSER AND LONG DIFFUSER. SHORT DIFFUSER MOST CLOSELY REPRESENTS THE PROPOSED DIFFUSER DESIGN SUBMITTED BY THE PERMITTEE. LONG DIFFUSER IS A PRD-DESIGNED ALTERNATIVE THAT RESULTS IN BETTER DILUTION IN THE NEAR-FIELD UNDER EBB OR FLOW-TIDE CONDITIONS.

THE FILES ARE AS FOLLOWS

ZAPATA 1 : AFTER-SLACK ; SHORT DIFFUSER

ZAPATA 2 : SLACK TIDE

ZAPATA 3 : BEFORE-SLACK

ZAPATA 4 : AFTER-SLACK ; LONG DIFFUSER

ZAPATA 5 : SLACK TIDE

ZAPATA 6 : BEFORE SLACK.

ALL SCENARIOS WERE RUN USING CORMIX2 ; I.E. A MULTIPORT SUBMERGED DIFFUSER.

DESIGN SKETCHES OF THE TWO DIFFUSERS ARE ATTACHED.

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9-16-98

ZAPATA CORAL REEF ANALYSIS

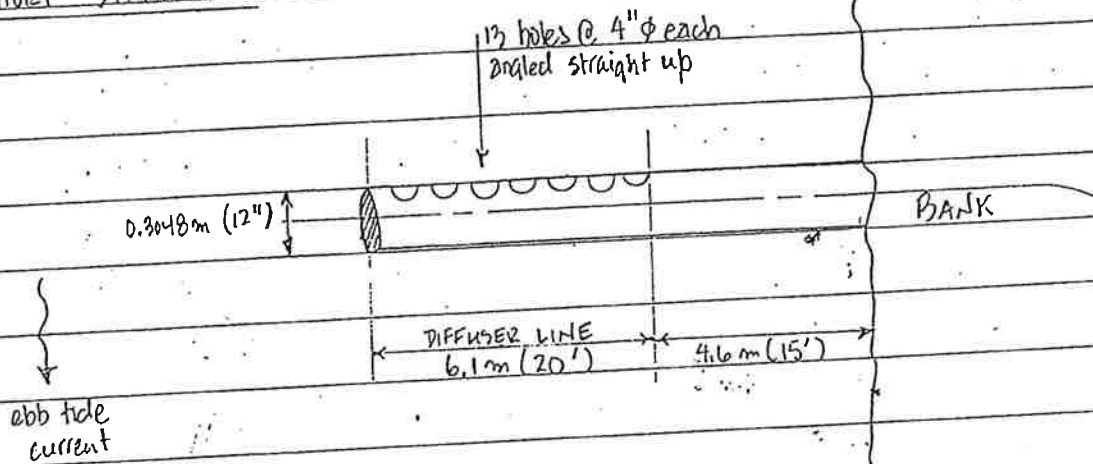
AMBIENT DATA

CHANNEL TYPE :	BOUNDED
WIDTH OF CHANNEL:	503 m
CHANNEL APPEARANCE:	FAIRLY STRAIGHT & UNIFORM
AVERAGE DEPTH:	1.524 m
ACTUAL DEPTH @ DISCH:	1.524 m
AMBIENT FLOW FIELD:	TIDAL REVERSING
PERIOD OF REVERSAL:	12.4 hr SEMI-DIURNAL
FLOW CONDITION :	① AFTER SLACK ; ② SLACK ; ③ BEFORE SLACK
TIME :	1.0 hr
INSTANTANEOUS AMBIENT VEL:	0.15 m/s
MAXIMUM AMBIENT VELOCITY:	0.30 m/s
MANNING'S "n" :	0.07
DENSITY CONDITIONS:	UNIFORM
FRESH OR NON-FRESH:	NON FRESH
AMBIENT DENSITY:	999.7 kg/m ³
WIND SPEED:	2 m/s

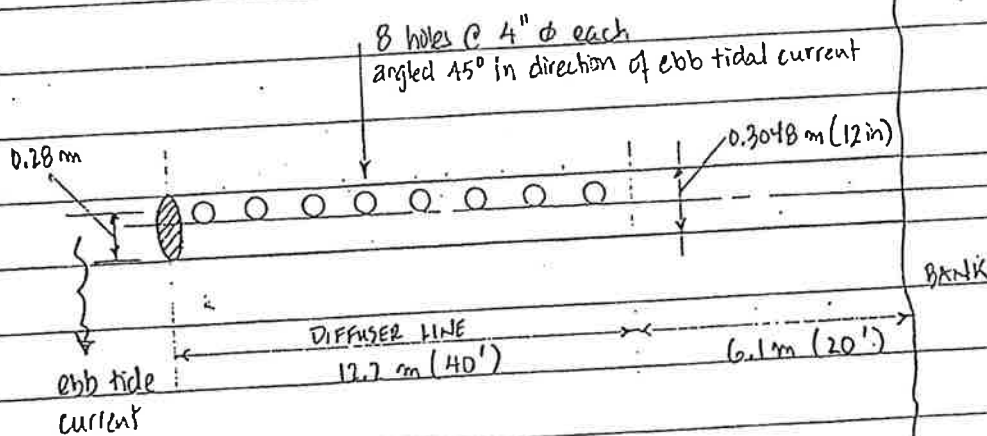
ZAPATA CORNIX DIFFUSER ANALYSIS - COCKREWS CREEK

9.16.98

SHORT DIFFUSER:



LONG DIFFUSER:



9.16.98

ZAPATA COXIX DIFFUSER ANALYSIS

DISCHARGE DATA

	SHORT	LONG
LENGTH OF DIFFUSER LINE:	6.1 m	12.2 m
BANK DIRECTION:	LEFT	LEFT
DISTANCE TO FIRST NOZZLE:	4.6 m	6.1 m
DISTANCE TO LAST NOZZLE:	10.7 m	18.3 m
ALIGNMENT ANGLE:	90	90
NUMBER OF OPENINGS:	13	8
SINGLE PORTS:	YES (A)	YES (A)
DIAMETER OF PORTS:	0.1 m	0.1 m
CONTRACTION COEFFICIENT:	1.0	1.0
HEIGHT OF PORT CENTERS:	0.3048 m	0.28 m
UNIDIRECTIONAL OR ALTERNATING:	ALTERNATING (B)	UNIDIRECTIONAL (A)
AVERAGE VERTICAL ANGLE:	-	90.45
RELATIVE ORIENTATION ANGLE:	-	90
SAME DIRECTION OR FANNED OUT:	SAME (A)	SAME (A)
HORIZONTAL ANGLE OF DISCHARGE:	-	0
DIFFUSER FLOW RATE:	0.0131 m/s	0.0131 m/s
FRESHWATER EFFLUENT:	YES	YES
TEMPERATURE:	27.7°C	27.7°C
HEATED DISCHARGE:	NO	NO
UNITS:	PPB	PPB
CONCENTRATION:	1000	1000
CONSERVATIVE SUBSTANCE:	YES	YES

ZAPATA CORNIX DIFFUSER ANALYSIS

9.16.98

MIXING ZONE SPECIFICATION

EFFLUENT TOXIC BY USEPA STANDARDS:

NO

AMBIENT WATER QUALITY STANDARD:

NO

RME SPECIFICATION:

NO

MAX DISTANCE OF REGION OF INTEREST:

6,000 m

NUMBER OF OUTPUT DISPLAY STEPS:

10

9-16-98

ZAPATA COCHIN DIFFUSER ANALYSIS

SUMMARY OF RESULTS

① SHORT DIFFUSER

FILE	AMBIENT SLENARIO	S
ZAPATA1	AFTER-SLACK	97.3
ZAPATA2	SLACK	5.8
ZAPATA3	BEFORE-SLACK	105.6

CONSERVATIVE AVERAGE = $(97.3 + 5.8) / 2 = 51.6$ SAY 50:1

② LONG DIFFUSER

ZAPATA4	AFTER-SLACK	197.9
ZAPATA5	SLACK	5.1
ZAPATA6	BEFORE-SLACK	210.8

CONSERVATIVE AVERAGE = $(197.9 + 5.1) / 2 = 101.5$ SAY 100:1

Original
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```

CO      = .1000E+04  CUNITS=  PPB
NTOX    =  0
NSTD    =  0
REGMZ   =  0
INT     =  6000.00  XMAX  =  6000.00

```

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 7.65 m from the LEFT bank/shore.
 X-axis points downstream, Y-axis points to left, Z-axis points upward.
 NSTEP = 10 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.
 A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:

BV = layer depth (vertically mixed)
 BH = top-hat half-width, measured horizontally in y-direction
 S = hydrodynamic average (bulk) dilution
 C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05
.76	.00	.35	34.2	.292E+02	.16	3.05
1.52	.00	.40	47.5	.210E+02	.32	3.06
2.29	.00	.44	57.4	.174E+02	.47	3.06
3.05	.00	.49	65.4	.153E+02	.62	3.06
3.81	.00	.53	72.3	.138E+02	.77	3.06
4.57	.00	.58	78.3	.128E+02	.92	3.07
5.33	.00	.62	83.7	.119E+02	1.07	3.07
6.10	.00	.67	88.6	.113E+02	1.22	3.07
6.86	.00	.72	93.1	.107E+02	1.37	3.08
7.62	.00	.76	97.3	.103E+02	1.52	3.08

Cumulative travel time = 101. sec

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

NEAR-FIELD REGION (NFR) **

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CORNELL MIXING ZONE EXPERT SYSTEM

Subsystem.version:

September 1996

ZAPATA VA0003887
SLACK^TIDE^SHORT^DIFFUSER

cormix\sim\ZAPATA2 .cx2

09/16/98--16:08:28

STRCND= U RHOAM = 999.7000

```

C0      = .1000E+04  CUMIIS=  FFB
IPOLL   = 1          KS    = .0000E+00  KD    = .0000E+00

```

1Q=B	=	.017	1M	=	.10	1m	=	99999.00
1mp	=	99999.00	1bp	=	99999.00	1a	=	99999.00

Tidal: Tu = .0797 h Lu = 3.432 Lmin = .157

FR0 = 5.44 FR00 (port/nozzle)
(slot)

2 Applicable layer depth
222

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS

Omega Fall 2000
p. 78 11/24

IO = .1000E+04 CUNITS= PPB
ITOX = 0
ISTD = 0
EGMZ = 0
NT = 6000.00 XMAX = 6000.00

-Y-Z COORDINATE SYSTEM:
ORIGIN is located at the bottom and the diffuser mid-point:
7.65 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
STEP = 10 display intervals per module

BEGIN MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

Initial conditions for individual jet/plume:
Average spacing between jet/plumes: .51 m
X Y Z S C BV BH
.00 .00 .30 1.0 .100E+04 .05 .05

END OF MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Jet/plume transition motion in weak crossflow.

Zone of flow establishment:
LE = .00 XE = .00 THETA= 90.00 SIGMA= .00
YE = .00 ZE = .30

Profile definitions:
BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = before merging: Gaussian 1/e (37%) half-width in horizontal plane
normal to trajectory
after merging: top-hat half-width in horizontal plane
parallel to diffuser line
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
Individual jet/plumes before merging:						
.00	.00	.30	1.0	.100E+04	.05	.05
.00	.00	.41	1.1	.877E+03	.06	.06
.00	.00	.52	1.5	.669E+03	.07	.07
.00	.00	.62	1.9	.526E+03	.08	.08
.00	.00	.73	2.3	.426E+03	.09	.09
.00	.00	.84	2.8	.353E+03	.10	.10
.00	.00	.94	3.4	.298E+03	.11	.11
.00	.00	1.05	3.9	.255E+03	.12	.12
.00	.00	1.16	4.5	.222E+03	.13	.13
.00	.00	1.27	5.1	.195E+03	.14	.14
.00	.00	1.37	5.8	.173E+03	.15	.15

Cumulative travel time = 7. sec
Merging of individual jet/plumes not found in this module, but interaction
will occur in following module. Overall jet/plume interaction dimensions:
.00 .00 1.37 5.8 .173E+03 .15 3.10

END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

ORMIX2 PREDICTION FILE:
 22
 CORNELL MIXING ZONE EXPERT SYSTEM Subsystem version:

CORNELL MIXING ZONE EXPERT SYSTEM
 Subsystem-version:
 Subsystem CORMIX2: CORMIX v.3.20
 Submerged Multiport Diffuser Discharges
 September 1996

CASE DESCRIPTION

```

ASE DESCRIPTION:
Site name/label: ZAPATA^VA0003867
Design case: BEFORE^SLACK^SHORT^DIFFUSER
FILE NAME: cormix\sim\ZAPATA3 .cx2
Time of Fortran run: 09/16/98--16:10:17

```

ENVIRONMENT PARAMETERS (metric units)

```

Bounded section
BS      =      503.00  AS      =      766.57  QA      =      114.99  ICHREG= 1
HA      =      1.52   HD      =      1.52
Tidal Simulation at TIME =      -1.000 h
PERIOD=      12.40 h  UAmag =      .300 dUa/dt=      .150 (m/s)/h
UA      =      .150 F      =      .334. USTAR = .3065E-01
UW      =      2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND=  U          RHOAM =  999.7000

```

DIFFUSER DISCHARGE PARAMETERS (metric units)

```

DIFFUSER DISCHARGE PARAMETERS (metric units)
Diffuser type:      DITYPE= alternating perpendicular
BANK = LEFT        DISTB = 7.65 YB1 = 4.60 YB2 = 10.70
LD = 6.10          NOPEN = 13 SPAC = .51
DO = .100          AO = .008 HO = .30
 zzle/port arrangement: alternating without fanning
GAMMA = 90.00      THETA = 90.00 SIGMA = .00 BETA = 90.00
UO = .128          QO = .013      = .1310E-01
RHO0 = 996.3187    DRHO0 = .3381E+01 GP0 = .3317E-01
CO = .1000E+04     CUNITS= PPB
IPOLL = 1          KS = .0000E+00 KD = .0000E+00

```

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)

```

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
q0      = .2148E-02  m0      = .2755E-03  j0      = .7123E-04  SIGNJ0= 1.0
Associated 2-d length scales (meters)
lQ=B    = .017  lm      = .16  lm      = .01
lmp     = 99999.00  lbp   = 99999.00  la      = 99999.00

```

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)

```

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
Q0      = .1310E-01  M0      = .1681E-02  J0      = .4345E-03
Associated 3-d length scales (meters)
LQ      =      .32  LM      =      .40  Lm      =      .27  Lb      =      .13
                                           Lmp     = 99999.00  Lbp     = 99999.00
                                           Lmin    =      .137
Tidal:      Tu      =      .0797 h  Lu      =      3.432  Lmin    =

```

NON-DIMENSIONAL PARAMETERS

NON-DIMENSIONAL PARAMETERS
 FRO = 5.44 FRD0 = 2.22 R = .85
 (slot) (port/nozzle)

FLOW CLASSIFICATION

[illegible]

STYING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS

CO = .1000E+04 CUNITS= PPB
NTOX = 0
NSTD = 0
EGMZ = 0
.INT = 6000.00 XMAX = 6000.00

-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
7.65 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.
JSTEP = 10 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.
A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:

BV = layer depth (vertically mixed)
BH = top-hat half-width, measured horizontally in y-direction
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05
.76	.00	.35	34.6	.289E+02	.16	3.05
1.52	.00	.40	48.4	.207E+02	.32	3.06
2.29	.00	.44	58.9	.170E+02	.47	3.06
3.05	.00	.49	67.8	.148E+02	.62	3.06
3.81	.00	.53	75.5	.132E+02	.77	3.06
4.57	.00	.58	82.5	.121E+02	.92	3.07
5.33	.00	.62	88.9	.112E+02	1.07	3.07
6.10	.00	.67	94.8	.105E+02	1.22	3.07
6.86	.00	.72	100.4	.996E+01	1.37	3.08
7.62	.00	.76	105.6	.947E+01	1.52	3.08

Cumulative travel time = 101. sec

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

IO = .1000E+04 CUNITS= PPB
 ITOX = 0
 ISTD = 0
 IEGMZ = 0
 IINT = 6000.00 XMAX = 6000.00

Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 12.20 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.

STEP = 10 display intervals per module

 BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10

END OF MOD201: DIFFUSER DISCHARGE MODULE

 BEGIN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

in this laterally contracting zone the diffuser plume becomes VERTICALLY FULLY MIXED over the entire layer depth (HS = 1.52m).
 Full mixing is achieved after a plume distance of about five layer depths from the diffuser.

Profile definitions:

BV = layer depth (vertically mixed)
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic average (bulk) dilution
 C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10
.61	.00	.33	67.6	.148E+02	.15	6.09
1.22	.00	.38	94.5	.106E+02	.30	6.09
1.83	.00	.42	114.6	.873E+01	.46	6.09
2.44	.00	.47	131.1	.763E+01	.61	6.09
3.05	.00	.52	145.3	.688E+01	.76	6.08
3.66	.00	.57	157.9	.633E+01	.91	6.08
4.27	.00	.62	169.3	.591E+01	1.07	6.08
4.88	.00	.67	179.6	.557E+01	1.22	6.08
5.49	.00	.71	189.1	.529E+01	1.37	6.08
6.10	.00	.76	197.9	.505E+01	1.52	6.08

Cumulative travel time = 40. sec

END OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

 BEGIN MOD251: DIFFUSER PLUME IN CO-FLOW

CO = .1000E+04 CUNITS- PPB
 NTOX = 0
 NSTD = 0
 EGMZ = 0
 AINT = .6000.00 XMAX = .6000.00

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 Omega fact
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X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 12.20 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.
 NSTEP = 10 display intervals per module

BEGIN MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.05	.05

END OF MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Jet/plume transition motion in weak crossflow.

Zone of flow establishment:
 LE = .00 XE = .00 THETA E = 45.00 SIGMA E = .00
 YE = .00 ZE = .28

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = before merging: Gaussian 1/e (37%) half-width in horizontal plane

after merging: top-hat half-width in horizontal plane
 parallel to diffuser line

S = hydrodynamic centerline dilution

C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
Individual jet/plumes before merging:						
.00	.00	.28	1.0	.100E+04	.05	.05
.08	.00	.37	1.1	.900E+03	.06	.06
.15	.00	.46	1.4	.703E+03	.08	.08
.21	.00	.57	1.8	.566E+03	.09	.09
.26	.00	.67	2.2	.465E+03	.10	.10
.31	.00	.78	2.6	.390E+03	.11	.11
.35	.00	.89	3.0	.331E+03	.12	.12
.39	.00	1.01	3.5	.286E+03	.14	.14
.42	.00	1.12	4.0	.249E+03	.15	.15
.45	.00	1.24	4.6	.220E+03	.16	.16
.48	.00	1.35	5.1	.195E+03	.17	.17

Cumulative travel time = 6. sec

Merging of individual jet/plumes not found in this module, but interaction
 will occur in following module. Overall jet/plume interaction dimensions:

.48	.00	1.35	5.1	.195E+03	.17	6.15
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END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

BEGIN MOD222: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

Vertical angle of layer/boundary impingement	=	77.35 deg
Horizontal angle of layer/boundary impingement	=	.00 deg

Discharge into STAGNANT AMBIENT environment:
STEADY-STATE MIXING CONDITION IS NOT POSSIBLE in this zone,
even though some ADDITIONAL DILUTION MAY OCCUR!
Also, all far-field processes will be UNSTEADY.
SIMULATION STOPS because of stagnant ambient conditions.

ND OF MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

* End of NEAR-FIELD REGION (NFR) **

SIMULATION STOPS because of STAGNANT AMBIENT conditions.
All far-field processes will be UNSTEADY.

[illegible]

CO = .1000E+04 CUNITS= PPB
NTOX = 0
NSTD = 0
NEGMMZ = 0
LNT = 6000.00 XMAX = 6000.00

-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
12.20 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.

STEP = 10 display intervals per module

----- BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10

END OF MOD201: DIFFUSER DISCHARGE MODULE

----- BEGIN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

In this laterally contracting zone the diffuser plume becomes VERTICALLY FULLY MIXED over the entire layer depth (HS = 1.52m).
Full mixing is achieved after a plume distance of about five layer depths from the diffuser.

Profile definitions:

BV = layer depth (vertically mixed)
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10
.61	.00	.33	68.1	.147E+02	.15	6.09
1.22	.00	.38	95.8	.104E+02	.30	6.09
1.83	.00	.42	116.9	.855E+01	.46	6.09
2.44	.00	.47	134.7	.742E+01	.61	6.09
3.05	.00	.52	150.3	.665E+01	.76	6.08
3.66	.00	.57	164.3	.609E+01	.91	6.08
4.27	.00	.62	177.2	.564E+01	1.07	6.08
4.88	.00	.67	189.1	.529E+01	1.22	6.08
5.49	.00	.71	200.3	.499E+01	1.37	6.08
6.10	.00	.76	210.8	.474E+01	1.52	6.08

cumulative travel time = 40. sec

END OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

Phase 1: Vertically mixed, Phase 2: Re-stratified

Case 2: The flow has RESTRATIFIED at the beginning of this zone.

This flow region is INSIGNIFICANT in spatial extent and will be by-passed.

END OF MOD251: DIFFUSER PLUME IN CO-FLOW

* End of NEAR-FIELD REGION (NFR) **

BEGIN MOD241: BUOYANT AMBIENT SPREADING

Discharge is non-buoyant or weakly buoyant.
Therefore BUOYANT SPREADING REGIME is ABSENT.

END OF MOD241: BUOYANT AMBIENT SPREADING

BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

Vertical diffusivity (initial value) = .935E-02 m²/s
Horizontal diffusivity (initial value) = .117E-01 m²/s

The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

Profile definitions:

profile definitions:
 BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
 = or equal to layer depth, if fully mixed
 = or equal to layer depth, (46%) half-width,

BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
volume boundary (Z-coordinate)

ZU = upper plume boundary (Z-coordinate)

ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
ZC = centerline dilution

ZL = lower plume boundary (Z coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes

ZL = lower plume boundary
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

Plume Stage 1 (not bank attached):	X	Y	Z	S	C	BV	BH	ZU	ZL
	6.10	.00	1.52	210.8	.474E+01	1.52	6.12	1.52	.00
	51.64	.00	1.52	227.8	.439E+01	1.52	6.97	1.52	.00
	97.17	.00	1.52	249.6	.401E+01	1.52	7.73	1.52	.00
	142.71	.00	1.52	273.5	.366E+01	1.52	8.42	1.52	.00
	188.24	.00	1.52	297.7	.336E+01	1.52	9.05	1.52	.00
	233.78	.00	1.52	321.4	.311E+01	1.52	9.65	1.52	.00
	238.07	.00	1.52	323.5	.309E+01	1.52	9.70	1.52	.00
				1587. sec					

238.07 .00 1.52 525.5
Cumulative travel time = 1587. sec
CORMIX prediction has been TERMINATED at last prediction interval.
Limiting distance due to TIDAL REVERSAL has been reached.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

[illegible]